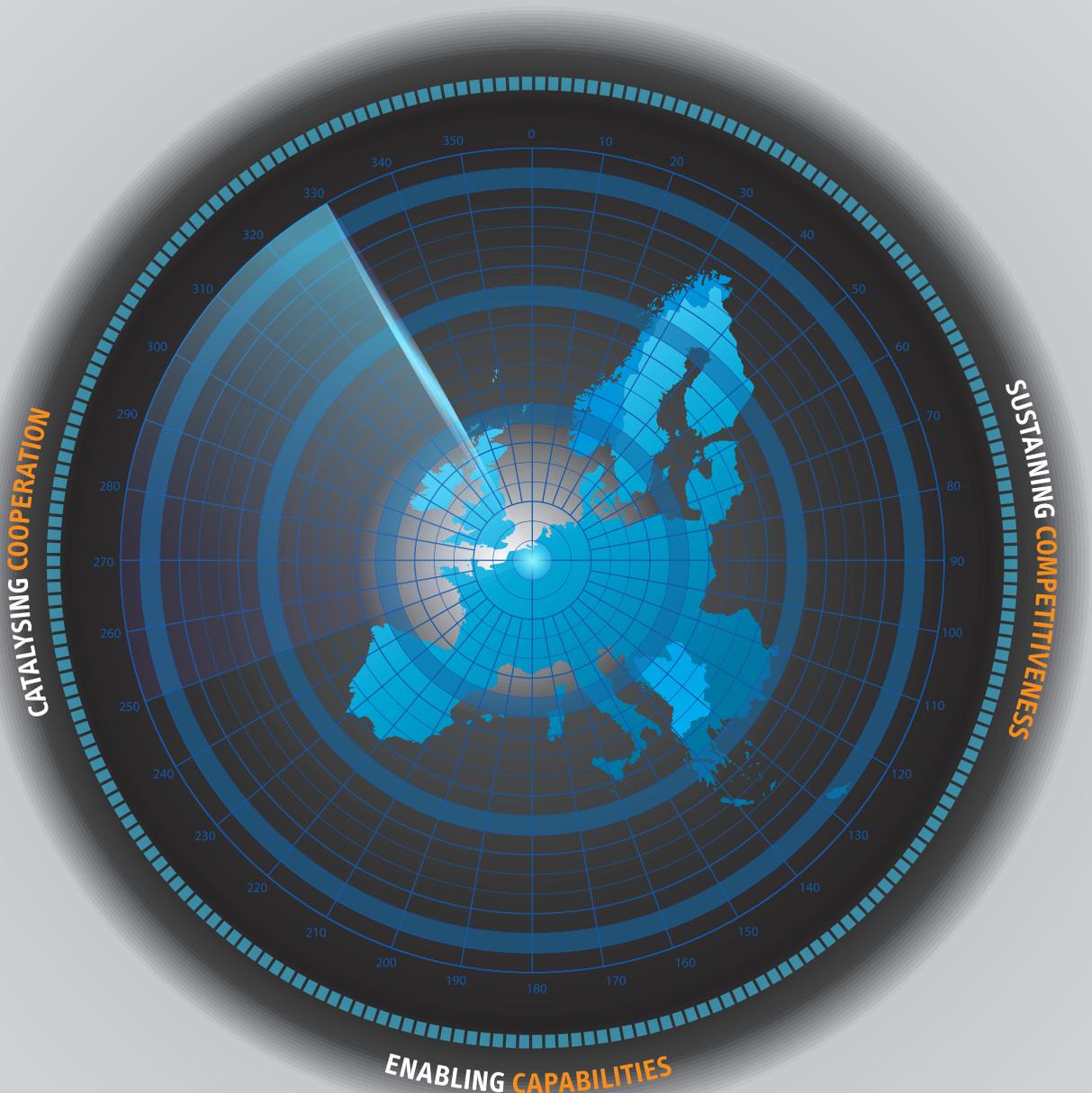


GROUP OF PERSONALITIES

EUROPEAN DEFENCE RESEARCH

The case for an EU-funded defence R&T programme



**REPORT OF THE GROUP OF PERSONALITIES
ON THE PREPARATORY ACTION FOR CSDP-RELATED RESEARCH
EUROPEAN DEFENCE RESEARCH**

The case for an EU-funded defence R&T programme

**CATALYSING COOPERATION
ENABLING CAPABILITIES
SUSTAINING COMPETITIVENESS**

**Rapporteur:
European Union Institute for Security Studies**

February 2016



The **European Union Institute for Security Studies (EUISS)** is the Union's agency dealing with the analysis of foreign, security and defence policy issues. The Institute was set up in January 2002 as an autonomous agency under the Common Foreign and Security Policy (CFSP) [Council Joint Action 2001/554, amended by Council Joint Action 2006/1002] to foster a common security culture for the EU, support the elaboration and projection of its foreign policy, and enrich the strategic debate inside and outside Europe. The Institute's core mission is to provide analyses and fora for discussion that can be of use and relevance to the formulation of EU policy. In carrying out that mission, it also acts as an interface between European experts and decision-makers at all levels.

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THE GROUP OF PERSONALITIES

Foreword

Europe's capacity to provide for its own security depends on our ability to continuously innovate to ensure technological leadership and be a credible partner to our allies. The recent dramatic falls in investment in R&T risk undermining our efforts to support the sector and our broader defence and security goals.

From 2006 to 2013 member states' spending in defence R&T dropped by 27.6%.¹ As a consequence, defence companies are surviving on the benefits of past R&T investments and are dependent on replacing falling domestic demand with exports. However, this often comes at the cost of transfers of technology, loss of IPRs and the move of production and jobs outside the EU. This has serious long-term implications for the competitiveness of our technological and industrial base.

The Commission is determined to do all it can to reverse this trend. The proposal for the Preparatory Action is a key part of its strategy to achieve this. Concentrating additional funding on key priorities can have a significant leverage effect. It should be a catalyst for national R&T efforts. If it succeeds, it can pave the way forward for a long-term EU defence-related programme. This is our long-term objective.

The member states had agreed that 20% of defence R&T expenditure should be devoted to collaborative research, but the current figure is actually less than 10%.² European funding of research priorities can be a strong tool to bring all relevant actors more closely together. It can also, in the medium term, help harmonise requirements for the development of capabilities and help pool demand.

1. EDA Defence Data 2013

2. EDA Defence Data 2013

This work on research in defence is part of a broader policy goal to strengthen European defence cooperation. To that effect, the Commission will present an Action Plan on defence this year.

The Group of Personalities (GoP),³ which I convened, has been critical in helping to shape the Commission's plans for the Preparatory Action and in providing strategic advice on the longer term aspirations for EU-funded defence-related research.

Over the past twelve months the GoP has devoted considerable work to this initiative. I would like to thank all the members of the Group and the EU Institute for Security Studies for their efforts in the preparation of the attached report.

Elżbieta Bieńkowska
European Commissioner for Internal Market, Industry,
Entrepreneurship and SMEs

Brussels, January 2016

3. See list of members at page 15.





Acknowledgements

This report is the result of several months of regular conversation and consultation among a group of experts encompassing the ‘sherpas’ (each nominated by a member of the Group of Personalities), officials from the European Commission (notably DG GROW) and the Rapporteur (the EUISS). Drafts have been proposed, amended and eventually consolidated, and specific proposals were discussed and eventually agreed. The intended ambition is to provide an end product – presented here – which conveys a clear vision of the scope of the Preparatory Action, a workable format for its implementation, and some suggestions for its follow-up.

The EUISS would like to thank Commissioner Bieńkowska and the Group of Personalities for entrusting this task to the Institute and for supporting its work throughout the entire exercise. From DG GROW, in particular, Slawomir Tokarski, Alain Alexis, Martin Blom, Thierry Buttin, Charalampos Giannakopoulos and Sylvia Kainz-Huber have provided invaluable help and guidance in understanding the *modus operandi* of the ‘comitology’ system and the Preparatory Action. From the EUISS, Jan Joel Andersson has provided precious advice on its contents and Philip Worré has given it the final push into a printed publication.

Special mention, however, must be given to Pierre Minard who has been essential in shaping the text as we have it and Marco Funk who has fine-tuned its language and structure.

Needless to say, the ultimate responsibility for all possible inaccuracies lies exclusively with the Rapporteur.

Antonio Missiroli
Director, EUISS

Paris, January 2016



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Executive Summary

THE CONTEXT

Europe's security environment has changed dramatically over the past few years, with consequences that now directly affect EU citizens. Conflict and instability in Europe's neighbouring areas have created spill-over effects that now concern practically the entire EU. External engagement, now coupled with domestic vigilance, has therefore become a critical necessity which requires adequate means. To ensure its long-term security, Europe needs political will and determination underpinned by a broad set of relevant policy instruments, including strong and modern military capabilities. Investing in future-oriented defence research programmes today is crucial to developing the capabilities that will be required tomorrow.

However, Europe's ongoing economic and fiscal crisis has clearly had a negative impact on the resources available to EU member states to engage in security-related activities. At the same time, threats have become more 'hybrid', less conventional, and very difficult to tackle with traditional means and without international cooperation. For its part, the US strategic 'pivot' to Asia forces Europeans to take defence more seriously.

This overall context highlights the need for European countries to avoid becoming too heavily reliant on the direct support of external allies and partners for their security and defence needs. Consequently, there is a need to maintain a viable domestic or European defence technological and industrial base (EDTIB) and a well-functioning system for intra-European transfers. Joint cooperation is the only effective way to achieve this, since no single European country can afford to maintain a full-spectrum defence industrial base and corresponding military capabilities on its own. To date, political guidance to this effect from the highest EU political level has struggled to be translated into corresponding practice and concrete results. Still, the EU can play a key role in this regard by acting as a facilitator, enabler and accelerator for defence cooperation

schemes and as a provider of targeted incentives to help develop member states' own defence capabilities.

A globally competitive defence industry is not only crucial from a security perspective, it is also economically significant. European defence companies are major employers of highly skilled individuals with high annual turnovers. Furthermore, important synergies exist between the defence and civil sectors.

As military operational capability and defence industrial know-how are intrinsically linked, Europe must continuously assess its key defence industrial capabilities, which also means acting before it becomes too late or prohibitively expensive to save or develop them. This will require an objective assessment of at-risk capabilities, to determine which should be sustained, rebuilt, or developed in Europe in order to assure an appropriate level of strategic autonomy, freedom of action and security of supply. Defence R&T forms the basis of effective and credible defence capability – and that is where the EU can play a key role to improve the status quo. Indeed, at present, defence research is primarily a national affair, driven by considerations about maintaining as many national capabilities as possible, and incentives to cooperate are lacking or inadequate. On top of that, funding has been declining significantly at all levels in the recent past.

An EU-funded Defence Research Programme (EDRP) may therefore help address this issue by fostering cooperation as a goal and means to achieve common strategic objectives. The added value of a European approach lies precisely with its ability to coordinate a wide variety of stakeholders ranging from national Ministries of Defence as sole customers to defence industries as sole providers of defence capabilities, in order to achieve outputs to the benefit of all.

THE PREPARATORY ACTION

The European Union is the only actor that has the potential resources to establish such a comprehensive European R&T programme, namely through the Multiannual Framework Programme referred to in art.182 TFEU. At the same time, the EDA is the only EU body with the mandate to define collective defence capability and research priorities and support defence cooperation, and is therefore the most logical and appropriate vehicle to identify and review priorities in this domain.

In order to explore the possibilities of establishing an adequate EDRP, the European Commission will set up a Preparatory Action (PA), which – along with the Pilot Pro-

ject (PP) on CSDP-related research, established following an initiative of the European Parliament – will serve as an initial tool designed to pave the way to such a programme within the next Multi-Annual Financial Framework (2021-2027). The PA should prove the concept and added-value of EU-funded research by defining priority areas which should be complementary and supplementary to activities already covered by other programmes – at either the national or European level.

The PA should therefore be designed in such a way that it can deliver results within its limited time frame. The number of topics, their level of complexity, the portfolio's own internal balance and the likelihood of achieving visible results quickly must all be taken into account in the design process. The PA can certainly strengthen European defence capabilities by supporting projects in fields where cooperative programmes are needed in order to rapidly implement demonstration programmes, and where European industry has the innovation and manufacturing skills necessary to develop cutting-edge technologies.

The PA should carry out capability-driven research projects addressing common needs, but it should also focus on innovation-driven technologies, advanced concepts as well as critical competences. To maximise EU added value, the PA and the ensuing EDRP must be closely related to and supportive of EU policies and objectives. They should rest upon sound market principles, foster cooperation between national ministries, and boost competitiveness. They should also be part and parcel of the Commission's Defence Action Plan, anchored in the forthcoming EU Global Strategy and based on - and responsive to - future commonly defined European defence capability needs and priorities.

As a result of the particularities associated with defence-related research, some of the governance rules and modalities that are currently in use for Horizon 2020 (H2020) will have to be adapted. The PA should therefore test various solutions and gain experience in order to establish a suitable governance structure which is also consistent with existing defence R&T activities performed at both the national and international levels. At the same time, in order to reflect the views of the member states (i.e. the end-users of defence capabilities), a Programme Committee composed of member state representatives should act as a decision-making body under the stewardship of the Commission, the current financial rules and regulations should be respected and the 'comitology' *modus operandi* applied.

One feature of H2020 programmes that would certainly need to be adapted is the role of the Advisory Group, which represents the views of major stakeholders. In the case of EU defence research, these would include the defence industry, defence experts, defence-oriented Research Technology Organisations (RTOs), the EEAS and the EDA itself. Therefore, as defence research requires much closer dialogue among stakeholders than

is typically found in Advisory Groups, a more inclusive, tailor-made *Defence Advisory Group* (DAG) should assume the function of the traditional Advisory Group.

H2020 Work Programmes are normally implemented by an Executive Agency - a role which, in the case of EU defence research, would most naturally be performed by the EDA. In practice, the EDA would be responsible for establishing a list of independent experts sourced from the member states which would then need to be formally approved by the Commission. The selected experts would then evaluate proposals according to an agreed set of criteria. Typically, under H2020, these include *scientific excellence, impact, quality and efficiency of implementation*. Due to the specificities of defence research, the criteria should be tailored to include *strategic relevance, EU added value* – i.e. the comparative advantage of carrying out a project through the EU and European partners rather than nationally – *member states' market uptake, innovative potential and European value for EU money*.

As the overarching goal of a defence R&T programme would be to help Europe protect and defend its citizens and its interests by maintaining its EDTIB in key capability areas, only legal entities in the 28 EU member states (plus Norway) should be eligible to participate. In addition, a number of eligibility criteria could be set regarding the participants' ability to carry out defence-related projects in Europe, to meet adequate security of information and security of supply requirements, and to ensure effective European control of the technologies developed.

Standard H2020 funding practices would also need to be adapted to defence research needs. While H2020 typically provides funding at levels between 70% and 100% of the eligible direct costs (plus a 25% allowance for additional costs), worldwide typical funding for defence research is close to 100% of true costs. The PA should therefore seek to provide full 100% coverage of the total direct costs plus a higher percentage for additional costs than that foreseen by H2020. Yet PA research funding (to be established in the form of grants) should not be perceived merely as extra money; it will have to highlight the benefits of collaborative programmes in some key areas and thus pave the way for more cooperative R&T activities across Europe.

Another important issue is the approach towards Intellectual Property Rights (IPRs). Particular consideration should be given to designing an appropriate IPR regime that is tailored to the sensitivities of the defence domain whilst also sufficiently attractive to both national defence ministries and industry, in order to ensure that the programme can address defence capability needs and priorities. For the PA, a balanced approach should ensure that foreground IPR be vested in the consortium partners in the case of grants, that background IPR be protected, and that recipients make a package of information available to the EU and the member states explaining the aim of the research and summarising the results achieved.

THE FUTURE

A sufficiently large, comprehensive EU-funded Defence Research Programme (EDRP) would satisfy the differing visions member states may have regarding their own future defence strategies while also stimulating cooperation and convergence among them, also at the EU level. Preparation of the EDRP will need new thinking and innovative political, institutional, procedural and financial solutions. Conceptual detailed preparation of the EDRP should therefore start quickly and run in parallel to the implementation of the PA.

Several structural and conceptual points should still be considered for the establishment of such a programme. These include exploring whether to use tailored co-funding arrangements as well as determining how to define research priorities and develop corresponding roadmaps, how to strike a balance between security-driven and market-driven considerations, how to ensure market uptake of research results, how to involve companies from 'friendly' third countries, how to link the programme with other EU-funded R&T programmes, and how to encourage spill-over effects of military technologies to the civil sector.

The PA was initially proposed by the European Council in December 2013 and reiterated in June 2015 in the context of increasing attention given to the issue of Europe's military capabilities and strategic autonomy, particularly its defence R&T component. Initiatives such as the EU Global Strategy and the European Commission's Defence Action Plan highlight the growing importance of common policies and instruments. It would therefore be desirable to connect the PA and the follow-on EDRP to other ongoing efforts in the industrial and technological domain, explore innovative ways of financing projects, and combine various approaches for a comprehensive reappraisal of Europe's strategic priorities and instruments with a view to fulfilling future capability needs. Adaptation, cooperation and innovation should thereby constitute the leading principles for a better response to the rapidly evolving security challenges which Europe is facing.

Continuing the *status quo* of almost exclusively nationally-oriented and domestically-funded defence research programmes is hardly a sustainable option if Europe wishes to maintain credible military capabilities and ensure the long-term competitiveness and relevance of its defence industry. In the not too distant future, no single European country will have the resources necessary to develop a full range of capabilities on its own - so now is the time to start pooling resources, particularly within the framework of an EU-funded defence R&T programme.



Key Recommendations

Fostering defence research cooperation at the EU level will enable the Union to live up to its responsibilities as an effective security provider and a relevant and reliable partner at the global level. To this end, with a view to the launch and implementation of the Preparatory Action (PA) and a future EU-funded Defence Research Programme (EDRP), the Group of Personalities recommends the following:

In terms of *principles*:

1. The PA and the EDRP should act as a catalyst for European cooperation in key capability areas, breaking down the barriers and overcoming the disincentives to cooperation that exist today. Effective coordination must ensure that the PA – as well as the ensuing EDRP – complements and supplements other research activities at the European, national or NATO levels, and does not lead to duplicated efforts at any level.
2. The governance approach adopted for the PA will be derived from Horizon 2020, with some essential adaptations to address defence specificities. However, a more tailored governance model will be required for the EDRP, given its foreseeable size and strategic goals. For their part, the topics chosen for the PA should lead to some ambitious demonstrators for the EDRP and be supported with adequate resources.
3. Close cooperation between governments (as sole customers), industries (as main suppliers) and R&T organisations is crucial for the success of the PA/EDRP. Such cooperation is necessary for the preparation of the work programmes as well as for decisions on the use of research results. The governance of the future programme must reflect this in order to ensure that research activities lead to market uptake and the development of required new capabilities.

In terms of *modalities*:

1. An essential goal of an EDRP will be to sustain an appropriate level of strategic autonomy for Europe by maintaining its defence technological and industrial base in key capability areas. Therefore, only legal entities in the 28 EU member states (plus Norway) should be eligible to participate. Eligibility criteria should be clearly defined to assure the effective control of the technology developed and ensure that the European added value generated by EU public investment is maximised.
2. The PA should aim at providing full 100% coverage of the eligible direct costs, plus a percentage higher than 25% – and surely no lower than that of non-EU competitors – for additional costs. Options for co-funding by member states should also be considered, possibly through new innovative business models derived from current models like the Pre-Commercial Procurement and JTI/JU arrangements.
3. To make the future EDRP more effective, it must be accompanied and supported by initiatives in other areas (security of supply, fiscal and financial initiatives, coordinated defence planning, and harmonisation of requirements). The PA/EDRP should therefore be part of a broader European defence policy framework - based on the EU Global Strategy and the Commission's Defence Action Plan - aimed at facilitating and enabling defence cooperation at all levels.

In terms of *resources*:

1. The Preparatory Action (PA) for CSDP-related research needs a sufficient budget to effectively test the governance scheme and the specific modalities to be employed as well as different categories of research activities (capability-driven and innovation-driven), notably including demonstrator development actions. A tailor-made approach will be required to maintain (and possibly increase) the level of national investments in R&T while also bringing to bear the Union's added value and potential multiplier effect.
2. The June 2015 Foreign Affairs Council deliberated that “the maximum amount possible” should be allocated to the PA. Given its critical importance for Europe's long-term security and the need to test projects immediately, a total of €75-100 million should be earmarked for the PA. It would also be appropriate to allocate the total required funds for all three years from the start, taking into account the long timeframe of defence industrial projects.

3. In turn, the PA should lead to a major dedicated EDRP as part of the next Multi-Annual Financial Framework (2021-27). Given the importance of defence research investment, the scale of existing national defence research budgets (the three biggest spenders in the EU each allocate more than €500 million per year) and the high costs of developing cutting-edge defence technologies, the EDRP will need a total budget of at least €3.5 billion for the period 2021-27 in order to be credible and make a substantial difference.

To assist with the preparation of the EDRP, the logic of the Group of Personalities should be transferred to a dedicated ‘European Defence Advisory Board’ (EDAB). This board would advise on all aspects of the Defence Action Plan, give strategic guidance on the principle, structure and modalities of the EDRP, inform its research agenda, and play an active part in the definition of a long-term European military capabilities blueprint, building on the ongoing debate about a possible European defence ‘White Book’. Such an EDAB would also have direct access to the highest level of the EU institutions to ensure clarity of purpose and consistency of action in the preparation and negotiation of the next MFF.





**Report of the
Group of Personalities
on the Preparatory Action
for CSDP-related research**



Chapter 1

Europe's security: trends, developments, principles

1.1 EUROPE'S STRATEGIC ENVIRONMENT: AN UPDATED APPROACH

The EU operates in an increasingly volatile and unpredictable security environment, at both the international and regional levels. The end of the US 'unipolar moment', the rise of China (and others), the outbreak of the global financial crisis, the Arab uprisings and their aftermath, the still unfolding crisis in Ukraine as well as the spread of radical Islamism ever closer to (and even into) Europe – all contribute to fundamentally reshaping the way in which the EU needs to 'do' security and defence, both at home and abroad.

Direct and indirect threats have increased quantitatively as well as qualitatively. Close to Europe, instability and conflict have risen dramatically: neighbouring states – both to the east and south – have proven to be fragile and contested, and the crises they have undergone have generated spill-over effects beyond their borders. Civil wars (sometimes conducted by proxy), sectarian strife (often fuelled by power rivalries), large ungoverned spaces across frontiers (in which ruthless quasi-state actors thrive at the expense of unprotected civilians) and unprecedented inflows of migrants and refugees go hand in hand with a resurgence of geopolitical competition, open challenges to international law as well as a more pervasive presence of terrorist networks – also inside European countries.

These multi-faceted security threats encompass conventional military tools (including covert action and militia warfare), primitive and even barbaric acts of intimidation and violence, but also highly sophisticated forms of recruitment, communication, disinformation and destabilisation – as well as various combinations of them all.

The post-Cold War international order is also increasingly being put into question by both emerging powers and now Russia. Traditional multilateralism struggles to deliver – be it on security, trade, climate, energy or finance – while new, more informal fora (like

the G20) do not seem capable of offering effective and lasting responses to global challenges and *ad hoc* formats (like the EU3+3 or the ‘Normandy’) can only address specific situations. Competing mini-lateral groupings (like the BRICS) indicate a willingness to challenge the ‘West’ but appear unlikely to produce a cohesive alternative bloc.

All in all, however, in this ever more complex and connected world, both our interests and our values – starting with a rules-based international order and the respect of human rights – are increasingly contested and challenged.

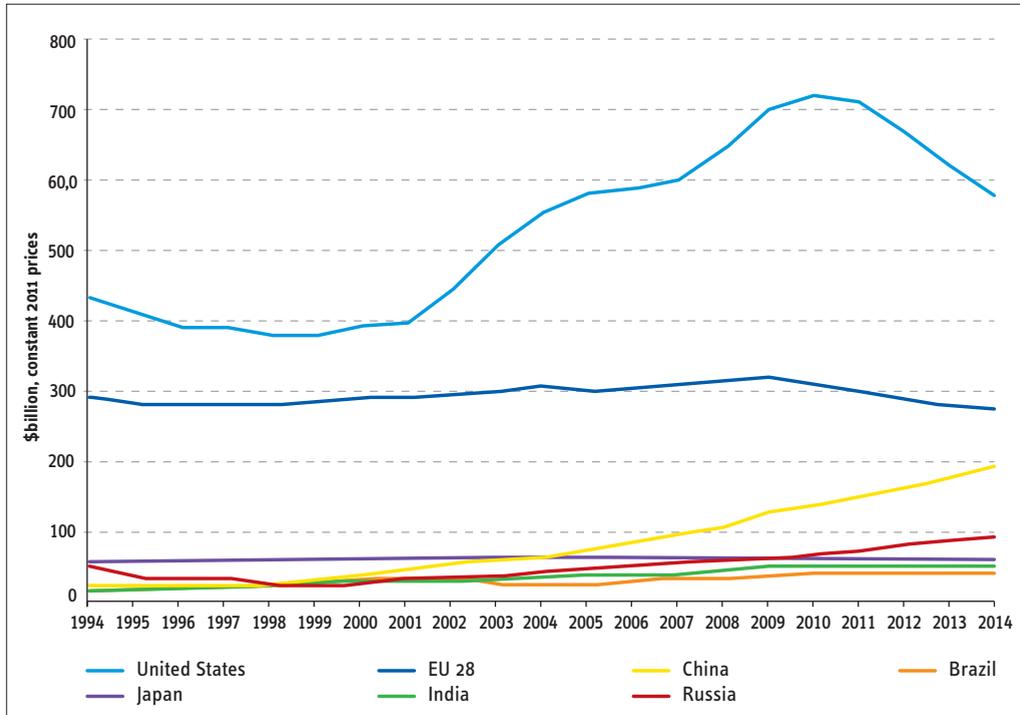
The global financial crisis and its repercussions in Europe (with the euro zone sovereign debt crisis and its aftermath) have also weakened the Union’s internal cohesion and, more indirectly, its ‘soft power’. The momentum of the ‘big bang’ enlargement is waning, the EU accession process is stalling, and the Union is competing with other players for influence in its neighbouring regions.

Nevertheless, large swathes of society in neighbouring countries embrace European values, and large numbers of individuals worldwide want to come and live in the EU. Difficult as it may have been, even the recent refugee crisis has strengthened the image and perception of Europe as a safe haven and a beacon of peace and security in an increasingly unstable world. The Union’s external transformative power will now depend on its ability to respond effectively to these expectations while taking those of its own citizens fully into account.

Retrenchment and isolation are not viable options. What happens on the edges of Europe ends up affecting the communities inside the EU. Engagement with neighbours (and beyond) is necessary to protect European citizens and defend European interests, and this has to be supported by adequate means.

The economic and fiscal crisis of the past five years has also had an acute impact on the means that the EU and its member states allocate to security. In fairness, defence spending in Europe started declining right after the end of the Cold War, and for understandable reasons: after all, the main threat to the West had virtually disappeared. Along with the decline in overall expenditure, defence industrial production volumes started decreasing significantly as well, and the very structure and composition of military forces in Europe underwent major changes. Since the 1990s, doctrines and priorities have evolved accordingly - at both the national and collective (NATO and EU) levels - while publics have grown accustomed to devoting an ever smaller share of national budgets to defence and security, with a stronger emphasis on expeditionary capabilities and combined peace operations.

FIGURE 1: DEFENCE EXPENDITURE (1994-2014)



Source: SIPRI

Box 1: European Council Conclusions, 19/20 December 2013 (excerpts)

‘Today, the European Council is making a strong commitment to the further development of a credible and effective CSDP, in accordance with the Lisbon Treaty and the opportunities it offers. The European Council calls on the Member States to deepen defence cooperation by improving the capacity to conduct missions and operations and by making full use of synergies in order to improve the development and availability of the required civilian and military capabilities, supported by a more integrated, sustainable, innovative and competitive European Defence Technological and Industrial Base (EDTIB). This will also bring benefits in terms of growth, jobs and innovation to the broader European industrial sector.’

These pre-existing trends have only been exacerbated by the onset of the financial crisis. As a result, the decline in defence spending has become even sharper across the EU-28 (with only a few notable exceptions) and risks producing a lasting loss of collective military and industrial capabilities at a time when other international players are, in contrast, increasing their defence expenditure. For their part, CSDP missions and operations seem to have lost steam after 2010 – with the partial exception of maritime activities against piracy, smuggling networks and organised crime. They also suffer from well-known capability shortfalls in areas such as strategic lift, surveillance and space-based assets, and cyber defence, as well as structural difficulties in force generation and common funding, which cast doubts over the Union’s ability and willingness to live up to its own commitments in this domain.

On top of that, threats to Europe’s security have recently become more ‘hybrid’ and less conventional, making them difficult to frame in traditional terms and to tackle with traditional means. Their origin or affiliation is often fuzzy and hardly attributable – be they ‘little green men’ without insignia, elusive hackers or ‘lone wolf’ terrorists. Responding to them requires joint innovative approaches that cut across both national borders and institutional or departmental boundaries.

Tackling these threats often also entails developing ever more sophisticated technologies for early warning, surveillance, detection, prevention and response. In this respect, the decreasing overall amount and share of R&D expenditure – which includes R&T (i.e. expenditure for basic research, applied research and technology demonstration) – in European defence budgets has become an additional source of concern.

In other words, the EU and its member states are confronting rising and ever more complex security challenges with declining internal resources. This is all the more worrying as the capabilities needed to face those challenges require sustained investment, innovative collaborative schemes, and solid technological expertise. Europe’s traditional reluctance to act militarily on the ground and use coercive force to achieve political goals – along with Washington’s exhortation to Europe to stop free-riding on the US and to ‘do’ more on defence, both within NATO and in its own neighbouring areas – only increases the need to develop defence capabilities supported by advanced technologies, also in view of the possible need to strengthen Europe’s overall military posture.

These challenges have been repeatedly acknowledged by the European Council since December 2013, which has called on the member states to allocate a sufficient level of defence expenditure, enhance defence capabilities, strengthen Europe’s defence industry, and foster European defence cooperation. However, political guidance from the highest EU political level has so far struggled to be translated into practice and concrete results.

The ongoing strategic reflection process, which was launched by the High Representative in June 2015 with her assessment of the global environment, is now set to lead to a new Global Strategy for the Union's foreign and security policy in June 2016, which seeks to redefine the EU's common interests, political objectives and policy instruments in light of the changes of the past (and next) few years. It is also expected to provide both European citizens and policymakers with a convincing narrative on why and how to reshape and optimise the capabilities at their disposal to face these new challenges collectively. Investing in relevant hi-tech capabilities - and in the defence research that underpins them - is an essential step to sustain Europe's global role and defend its common interests.

Box 2: European Council Conclusions, 25/26 June 2015 (excerpts)

'In line with the European Council conclusions of December 2013 and the Council conclusions of 18 May 2015, work will continue on a more effective, visible and result-oriented CSDP, the further development of both civilian and military capabilities, and the strengthening of Europe's defence industry, including SMEs. The European Council recalls the need for:

- the Member States to allocate a sufficient level of expenditure for defence and the need to make the most effective use of the resources;
- the EU budget to ensure appropriate funding for the preparatory action on CS-DP-related research, paving the way for a possible future defence research and technology programme;
- fostering greater and more systematic European defence cooperation to deliver key capabilities, including through EU funds.'

1.2 EUROPE'S STRATEGIC AUTONOMY: A BALANCED APPROACH

Europe's own security and its role as an external security provider are underpinned by the defence capabilities of EU member states, operating individually or collectively, whether unilaterally or together with key allies like the US and other partners inside and outside of NATO. In this context, the concept of 'strategic autonomy' – as articulated in a number of EU official documents since 2013 - highlights the need for European countries to retain an appropriate degree of *freedom of action* in critical military capability

areas rather than becoming ever more reliant on the support of allies and partners. While there can still be areas such as high-end capabilities where Europeans may still prefer to rely on and even elicit the support of allies (notably the US), such support cannot always be taken for granted. If Europe wants to remain a strong defence player and reliable partner – i.e. neither a follower nor a free-rider – it needs to discuss and better define what level of strategic autonomy it seeks to achieve.

Freedom of action relies on having sufficient expertise and know-how to develop and adapt key military equipment and capabilities to meet emerging threats and subsequent operational situations, without requiring permission from other states. It means being free and able to operate, maintain, upgrade and integrate new capabilities onto platforms when needed, in order to meet either urgent or longer-term requirements. It also means being able to reliably and credibly contribute to joint operations with allies at the highest levels, regardless of the institutional framework utilised. Interoperability and compatibility are indeed no less important in defining and qualifying freedom of action.

Strategic autonomy, however, should *not* mean generic European preference or the establishment of a ‘fortress Europe’. It would indeed be counterproductive to create unnecessary barriers to trade that hamper and limit the ability of European suppliers to gain access to foreign markets and vice versa. On the other hand, procuring equipment off the shelf - advantageous as it may be in many respects for industries and governments - can also generate technological dependencies due to restrictions (of a technical, operational or legal nature) on its autonomous use. That said, the development of global supply chains and the emergence of defence industrial capabilities in developing countries are likely to create further collaboration between compatible partners.

Strategic autonomy is also inherently linked to *security of supply* – short-term and long-term, in peacetime as well as in a crisis – since only by maintaining a viable domestic or European defence technological and industrial base (EDTIB) and a well-functioning system for intra-European transfers can a member state be assured that it will have access to key defence know-how. Since no European country can afford to maintain a full-spectrum defence industrial base on its own, the logical solution is to work with like-minded partners and improve defence cooperation by making the most effective use of the tools available to the Union.

A balanced approach is therefore needed in order to sustain an EDTIB capable of delivering cutting-edge defence systems and technologies, and of responding at the appropriate scale and speed to satisfy the potential procurement needs of European armed forces. For those capabilities that underpin operational freedom of action, EU member states need to consider whether the right balance is now being struck between dependency on offshore suppliers and preserving European capabilities and systems owner-

ship, so that the most critical technologies can be understood in-depth and utilised to their maximum operational capacity.

Europe's current globally competitive defence industry is the product of decades of investment. However, sustained pressure on national defence budgets is resulting in the loss and/or decline of key defence industrial and technological capabilities. Only continuous investment in next-generation defence technologies will sustain the industry in the long term. If the decline continues or even accelerates, it will inevitably have a detrimental impact on Europe's strategic autonomy.

Box 3: European Council Conclusions, 19/20 December 2013 (excerpts)

'To ensure the long-term competitiveness of the European defence industry and secure the modern capabilities needed, it is essential to retain defence Research & Technology (R&T) expertise, especially in critical defence technologies. The European Council invites the Member States to increase investment in cooperative research programmes, in particular collaborative investments, and to maximise synergies between national and EU research. Civilian and defence research reinforce each other, including in key enabling technologies and on energy efficiency technology. The European Council therefore welcomes the Commission's intention to evaluate how the results under Horizon 2020 could also benefit defence and security industrial capabilities. It invites the Commission and the European Defence Agency to work closely with Member States to develop proposals to stimulate further dual use research. A Preparatory Action on CSDP-related research will be set up, while seeking synergies with national research programmes whenever possible.'

In fact, Europe's defence industry depends on sustaining a critical mass of highly skilled, specialist workers who have collectively accrued decades of hard-earned experience on how to develop effective leading-edge knowledge-based military systems. This capability cannot easily be put on hold, or redeployed, or supported by transferring staff from adjacent sectors. Once it is lost, it is very difficult, very time-consuming and very expensive to rebuild.

Hi-tech defence industrial competitiveness is an intrinsic part of foreign policy as well as defence diplomacy. It underpins wider security relationships and military cooperation while helping to ensure that the domestic defence industrial base can be maintained at a scale that is profitable and competitive. As EU member states increasingly cooperate in order to fill capability gaps, hi-tech defence competitiveness will be essential in creating the economic dividends that support the business investment case for collaborative projects.

It is therefore essential that the supply of components within Europe, which is destined for incorporation onto European platforms for onward export, is not blocked or delayed unnecessarily by any narrow vested specific interest. Otherwise, European defence industrial cooperation will surely remain the exception, and strategic autonomy goals will become ever more elusive.

Last but certainly not least, Europe's strategic autonomy depends on a more collaborative approach towards defence-related capability planning, including equipment-related R&T and procurement – an approach built on best practices, underpinned by appropriate means and credible budgetary resources, and taking into account all possible means to encourage public and private investments in this domain. The EU can act as a facilitator, enabler and accelerator for defence cooperation schemes as well as a provider of targeted incentives to support the member states' own development of capabilities.

In this framework, an enhanced and shared knowledge base is a crucial factor: it is needed in order to identify evolving threats and potential scenarios, to translate these into capability requirements, including systems and technology, and to understand where technological disruptions may occur in order to steer common research efforts.





Chapter 2

Europe's defence: industry, market(s) and technological base

2.1 EUROPE'S DEFENCE INDUSTRY

Europe's defence industry is globally competitive, innovative, high-tech and capability-driven. As such, it is a major security enabler for the European continent, providing unique military know-how to defence ministries. Defence technologies are highly sensitive by nature, and most governments consider their defence industry to be an intrinsic element of their national security and a key ingredient of their ability to operate autonomously.

Today's European defence industry encompasses the full spectrum of defence technological capabilities (land, sea, air, space and cyber) – ranging from the largest, most complex platforms right through to advanced micro-electronic systems. This landscape is estimated by the French *Direction générale de l'armement* to comprise around 30 major first-tier suppliers [*Calepin des entreprises internationales de défense 2014*], including some of the world's leading system designers and integrators. They are also supported by a broad supply chain, which the European Commission's DG Growth estimates to include more than 1,350 specialised SMEs.

The sector is an integral part of the broader European aerospace, defence and security industry, which is recognised as a major generator of high technology jobs and a significant contributor to Europe's economic prosperity and growth. In its 2013 Communication [*Towards a more competitive and efficient European defence and security sector*], the European Commission estimated that the sector directly or indirectly employed about 1.4 million people (many of which highly-skilled), with an annual turnover of €96 billion.

Moreover, most of Europe's large defence companies also have significant civil sector interests, particularly in civil aerospace, space and security, and other domains that utilise similar hi-tech electronics-based systems and complex project management know-how (lately the share of their assets in the civil sector has even increased). This highlights the important synergies that exist between the defence and civil sectors, not to mention the spin-off benefits of investments in defence technology into the civil sector.

A recent EDA analysis [*The Economic Case for Investing in Europe's Defence Industry*, 2013] shows that cuts in defence spending have a disproportionately large impact on GDP, as each €100 million cut in defence expenditure results in a €150 million decrease in EU GDP and in the loss of thousands of jobs. Conversely, the leverage effect of each euro invested in defence generates returns averaging between 1.5 and 1.6. The benefits of defence investments have also been shown to exceed those of other sectors, in particular for exports, skilled employment and R&T.

2.2 EUROPE'S DEFENCE MARKET(S)

The defence market is unique and does not follow the conventional rules and business models that govern more traditional markets, such as those for consumer goods. A clear example is that the prevailing worldwide model of product development for large defence systems involves national governments funding almost 100% of the R&T costs.

The defence market is still, in fact, a 'monopsony': governments are the only end-customers for defence equipment and they act as the requirement specifier, the contracting authority, the regulator and, oftentimes, also as a supporter of exports – all at once. Moreover, many defence industries are either directly owned or substantially sponsored by the government. As a result, the supplier base is rather limited, involving only a select number of defence companies, since the political, economic and technological barriers to entry are high.

Furthermore, the majority of defence investment is still made in support of national considerations. The size of a country's defence industry contributes to defining its desired level of national defence capability, international ambitions and desire to maintain a certain degree of strategic autonomy. In the EU, all of this impinges upon the creation and implementation of a genuine defence internal market.

Finally, defence system development is both very long term and very high risk: it takes many years, sometimes even decades, to come to fruition, and defence capabilities must, by definition, be at the leading edge of technology – otherwise, the system may not pro-

vide military advantage over adversaries. This also means that operational needs may change over the course of product development; as a result, governments need the flexibility to adjust their requirements – or even, on occasion, to cancel a development project altogether.

In this context, it is quite challenging for defence companies to take on large scale R&T risks. This would put the relevant companies at a clear competitive disadvantage relative to their international competitors which are receiving government-funded R&T – with no realistic business case that could be justified to shareholders. Yet R&T activities are the first necessary step to prepare for future capability developments allowing for the maturing of technologies and the reduction of risks. The defence R&T investment made today will underpin the freedom of action available tomorrow, the preservation of operational and technological advantage, the reinforcement of industrial competitiveness and employment opportunities.

The defence industrial know-how that exists in Europe today has indeed been developed over the course of decades, and so has the supply chain supporting and complementing it; building it up has been a major achievement. It is instructive to observe that many countries outside Europe have struggled to reach the same level of defence technological competency despite years of effort and significant financial outlay. It is also noteworthy that many emerging powers are now convinced of the strategic importance of developing an indigenous defence industrial infrastructure, which they see as an essential guarantor of operational capabilities, autonomy and security of supply. Their growing investments, coupled with protective industrial policies, are already making competition on global markets ever fiercer.

Most EU member states have a domestic defence-related industry. The bulk (86%) of Europe's defence industry, however, is located in the larger six Letter of Intent (LoI) countries: France, Germany, Italy, Spain, Sweden and the United Kingdom plus Finland, the Netherlands, Poland and Portugal. The size of the industry is roughly proportionate to the level of government spending on defence procurement and R&T. The bigger member states have the largest defence industries and account for the lion's share of all EU defence R&T expenditure.

The smaller European countries mostly operate through SMEs or defence subsidiaries of civil-focused companies, which specialise in niche capabilities and/or form part of the supply chain for either European or offshore (mainly American) primes. Innovation takes place at all levels of the supply chain, from the prime system integrators through to SMEs, and their relationship is indeed symbiotic; neither can expect to exist (at least on a significant scale) without the other.

The model of defence industrial ownership differs markedly across Europe (and indeed worldwide), with some countries preferring an entirely private sector industry while others operate with some (or all) of their industry being fully or partly nationalised. Even where the private sector prevails, however, it has mostly evolved from a more state-owned model, and governments still insist on maintaining a degree of control over the companies' key strategic decisions, as well as keeping key technologies onshore.

There is undoubtedly significant duplication (and arguably overcapacity) in Europe's defence industrial capabilities. Yet there are also numerous bi- or multi-national cooperative endeavours as well as a visible transnational supply chain. Some duplication is understandable and even desirable, especially in terms of procurement competition and security of supply.

Yet duplication is also the consequence of the coexistence of different national interests and threat perceptions among member states, reflecting also the fact that defence remains a primarily national competency and defence markets are still quite fragmented. Most European defence capability programmes are equally likely to remain driven by similar considerations, since large scale consolidation means relinquishing a degree of national control. Still, unnecessary duplication does exist - including in R&T - and needs to be addressed with appropriate policies with a view to creating synergies, strengthening security of supply for all member states and, as a result, for Europe as a whole.

2.3 EUROPE'S DEFENCE INDUSTRIAL COMPETITIVENESS

Beyond the domestic European market(s), international market access and defence export activity are essential components of the business models used by Europe's defence industry. From an industrial viewpoint, access to international markets is a necessity, but not only as a means to compensate for a declining domestic market: export growth significantly contributes to sustaining the critical mass of European defence companies and highlights the competitiveness, capability, performance and reliability of European export products.

At the same time, growing third party offset demand also poses challenges, particularly in terms of technology transfer and can, if not carefully managed, put the European industry's competitive advantage at risk. Domestic demand coupled with export success is essential in order for Europe to retain viable and globally competitive de-

fence industrial players. Without exports, many European companies would now be struggling to survive the deep cuts in their national defence expenditure. However, the current generation of products available on the market is very much a legacy of past investments, made over the last two or three decades.

The defence export market is fiercely competitive and will only become more so, given the pressures on budgets in the traditional suppliers' own countries and new competitors from the emerging (and emerged) economies. The US is redoubling its efforts to export defence equipment in order to offset its own domestic defence spending cuts. The huge size of the US domestic market provides unmatched economies of scale which, combined with Washington's political clout, makes it a formidable export competitor. And the recent launch of the Third Offset Strategy (3OS) is likely to reinforce US technological leadership.

TABLE 1: SHARE OF TOTAL GLOBAL DEFENCE EXPORTS (%)

Share of total global defence exports (%)										
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014
EU	33.51	36.35	37.74	32.65	34.59	26.38	26.49	21.18	25.09	27.89
US	34.85	30.48	29.54	28.15	28.06	31.87	30.26	31.20	26.45	36.01
China	2.98	2.61	1.81	2.44	4.68	5.69	4.44	5.76	7.41	3.83
Russia	23.68	20.72	20.97	25.88	20.99	23.38	28.42	29.07	30.31	21.09
Rest of the world	7.95	12.46	11.75	13.32	16.36	18.37	14.83	18.55	18.15	15.01

Source: SIPRI Arms Transfer Database (retrieved 8 September 2015)

The new competitors are in the rapidly growing Asian economies, whose ambitions to foster their domestic defence industries are facilitated by expanding investment, innovation cycles and, to some extent, also technology transfers from Europe. While such transfers are an unavoidable feature of defence exports, the gap in capability levels between European and emerging competitors remains significant – at least for now – and actually often constitutes a competitive advantage for European offers to third countries. To keep this advantage in the face of these emerging competitors, more European efforts in defence R&T are necessary.

If EU member states do not to invest in the next generation of defence technologies and do not find a common position on defence exports, other countries will eventu-

ally displace European suppliers in export markets. Reductions in defence development spending in the EU are now resulting in a decline in the core engineering capabilities which are essential for developing next-generation systems. If we want to retain these key capabilities in the EU, we need to make better use of Europe's own scale, critical mass and market size.

2.4 EUROPE'S DEFENCE INDUSTRIAL COOPERATION

There is an ever stronger case for European countries to collaborate more in the development of defence equipment and achieve bigger economies of scale. International cooperation in defence - including armaments, science and technology - dates back to the Cold War, with NATO often acting as a hub. In fact, some of Europe's most iconic fighter aircraft, helicopters and missiles are still the result of cross-border defence industrial and technological cooperation at the multinational level. Over the past couple of decades, smaller multinational partnerships have also developed at the European level, and some projects are still ongoing, with variable geometries of participation, across the full range of capability development including concepts, training, exercises, science and technology, requirements harmonization, testing and evaluation.

The key problem facing the European defence industry is not a lack of competitiveness or underlying weakness, but a general lack of opportunities in terms of new defence equipment development programmes. And since no European country can any longer afford to meet all of its own requirements from purely domestic sources, there is a clear need for greater consolidation of demand in Europe through convergence (wherever possible) of military and operational requirements, alignment of national procurement plans and cycles - and, ultimately, the launch of new cooperative programmes.

Over the last few years, however, when faced with austerity and declining defence budgets, EU governments seem to have opted to do less together. In fact, there are fewer collaborative programmes today than there were 10 or 20 years ago, and no major multinational ones have been launched in Europe lately. This suggests that national political factors such as protecting local jobs, maintaining direct oversight and preserving skills are outweighing the economic and functional logic of cooperation. This is a dangerous trend and risks seriously compromising Europe's defence capabilities and long term security.

Defence industrial cooperation is a quintessential work in progress. Collaborative programmes are undoubtedly challenging; they require political decisions about the de-

sired level of interoperability and they typically take longer to implement (cooperation and coordination take time) and cost more than national programmes, even if the net cost per country is lower. Indeed, few countries would actively seek to develop defence products collaboratively if they could afford to do it alone. Yet more collaboration is an essential imperative for Europe's security and operational autonomy.

It is also important to assess whether cooperation exclusively among Europeans is the only or even the preferable solution. Potentially attractive alternatives could include, first and foremost, collaboration with the US or, possibly, even with newly emerging defence players at the global level. However, there are strong arguments in favour of European bi- and multilateral defence equipment development. These include:

- The proximity, cultural similarity and shared history among EU countries
- Often comparable foreign policy outlooks
- Common threats and shared interests
- A solid legacy of cooperative practice in the defence domain (along with the existence of enablers like OCCAR and the EDA)
- The EU treaties framework itself, and the legislation emanating from it
- Analogous legal systems and growing similarities in procurement systems and rules
- A significant record of undertaking combined expeditionary operations and missions (within the NATO and CSDP frameworks).

On top of that, the huge asymmetries between each individual European country and the US would make it extremely difficult for them to be truly equal development partners with Washington.

New cooperative programmes at the European level would thus generate an incentive to consolidate, rationalise and increase efficiency, with multiplier effects across the European continent. They would generate new export opportunities, providing both access to and leverage in international markets. They would also foster interoperability and maximise the capabilities of partnering countries. They would provide economies of scale while minimising the costs and risks associated with complex research and acquisition. And they would also stimulate innovation in both the emergence and the maturing of technologies.

The EDTIB is a concept very much in use by both the member states and the EU institutions. As it stands, it encompasses European companies based on European soil – including European subsidiaries of international companies as well as European firms that build systems under licence using designs owned outside of Europe. At the

same time, the EDTIB as we know it is not a world unto itself: a growing part of its supply chain is civilian. Defining the most useful industrial perimeter of action in Europe, however, is necessary in order to better focus European policies and instruments and thus generate an effective added value in operational, technological, economic and social terms. Such an industrial perimeter should include the key defence industrial capabilities needed to underpin an appropriate degree of European strategic autonomy and ensure that these are sustained in Europe for the long term, along with the capabilities jointly developed by the member states.





Chapter 3

Europe's defence research: the EU's added value

3.1 EUROPE'S DEFENCE R&T

Generally speaking, the process of developing new defence capabilities – as carried out by the member states – consists of four main steps: 1) capability requirement definition and planning, based also on the desired level of ambition and strategic autonomy; 2) R&T programmes in accordance with resulting strategic research agendas; 3) product development and production proper; and 4) capabilities implementation and incorporation into the armed forces as well as the full logistics and training chain. Within this sequence, constant and large scale investment in R&T is the bedrock of any effective and credible defence capability. It is only by continually pushing technological boundaries and experimenting with innovations in the field that defence equipment can remain in operation, evolve and keep up with evolving threats.

The defence research set-up in the EU is still primarily national, with a modest proportion of the overall research funds allocated to European programmes. Most of the defence research undertaken in the EU is funded by the member states, which have built it up over the years and consider it an essential element of their national security, enabling them to maintain military advantage. National Ministries of Defence (MoDs) have developed their own systems for capability planning, strategic research agendas and modes of implementation in close cooperation with national industries where these exist.

At the member state level, defence research is almost entirely funded by national governments, with funding typically disbursed to government-owned or supported defence research institutes and national industry. Investment in domestic defence research provides national defence ministries with in-depth understanding of the technologies available now and in the future, and of their foreseeable impact on the military domain.

This, in turn, enhances their ability to predict how and when current capabilities may become obsolete and vulnerabilities increase. Technological understanding also allows MoDs to act as smart customers and weigh the pros and cons of procuring off-the-shelf products as compared to developing capabilities domestically or in collaboration with others.

There are few cross-border collaborative defence research initiatives in Europe; some exchanges are conducted through inter-governmental defence cooperation, while others are channelled through NATO's Science and Technology Organization (STO). However, such limited activity at the multinational level is not due to a lack of institutional structures or policy tools.

In fact, since its entry into force in 2009, the Lisbon Treaty has clearly conferred upon the European Defence Agency (EDA) the task to 'support defence technology research, and coordinate and plan joint research activities and the study of technical solutions meeting future operational needs' within the framework of the CSDP (art. 45 TEU). The agency, in close cooperation with the member states, has developed (step 1) the Capability Development Plan (CDP).

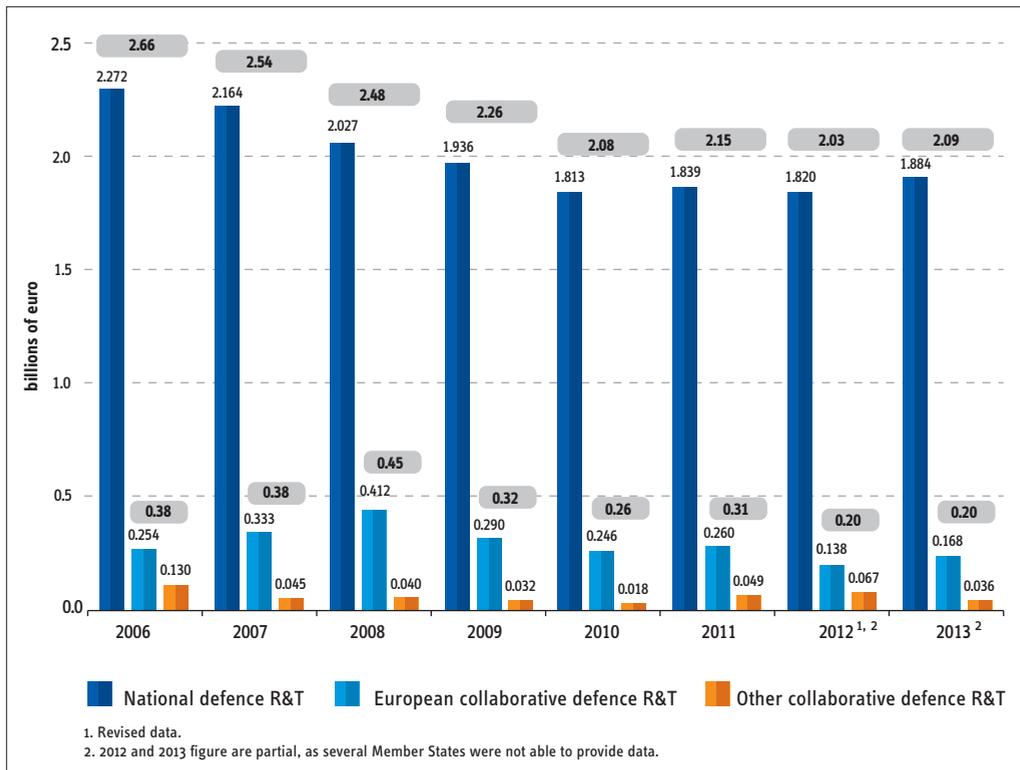
Approved by the EDA Steering Board and regularly reviewed and updated (most recently in 2014), the CDP offers a broad inter-governmental picture of the CSDP capabilities landscape. It identifies collective capability needs and shortfalls (including key enablers which are critical for the launch and sustainability of CSDP operations), also taking the science and technology dimension into account, and an overview of industrial capabilities and procurement plans. The aim of the CDP is to generate and prioritise actions in order to address capability shortfalls, thus orientating the member states' as well as the Union's efforts. However, it hardly addresses the capabilities that have been declared national prerogatives by the member states.

Once the capability priorities have been defined, R&T programmes should follow, at least in those areas where no preferred off-the-shelf acquisition alternatives exist, in order to develop the technological basis for those capabilities. In principle, these research programmes are undertaken by the national MoDs (step 2) and carried out within the defence research organisations and national industries of the participating member states. In practice, however, member states tend to prioritise 'hard power' capabilities for their national R&T plans, thus leaving little funding available for what are considered to be low priority capabilities. At the EU level, the Capability Technological Areas (CapTechs) from the EDA, which are fora composed of experts from MoDs, industry and academia, are tasked with the stimulation and promotion of R&T collaborative activities, projects and programmes to address technological opportunities and capability needs. In some cases, these have led to small-scale cooperative R&T projects, which are financed by national governments.

With this in mind, Strategic Research Agendas (SRAs) – inspired by those carried out in other areas by the European Commission – have been established to encourage better coordination of R&T activities among member states. These SRAs act as an inter-governmental tool for fostering cooperation in R&T and are the main joint European priority-setting and planning mechanism available today in this domain.

However, it is now evident that the CDP is not leading to decisions by the member states to invest more in collaborative capability projects or even to allocate their national defence research funding accordingly – as is similarly the case with SRA priorities. Lacking adequate core funding, some R&T priorities have not received the required support. Indeed, the EDA relies on member states' contributions that are granted on a case-by-case basis for each initiative; over the past ten years, projects carried out in the EDA framework have only received €500 million.

FIGURE 2: NATIONAL AND COLLABORATIVE DEFENCE R&T



In December 2008, the European Council agreed to set benchmarks to strengthen and optimise European capabilities, notably ‘to achieve, on a voluntary basis, the collective benchmark of 2% of defence spending on research funding’, as approved by the member states’ Ministers of Defence in November 2007. Nevertheless, in real terms, spending in defence R&T dropped by 27.6% between 2006 and 2013. The member states had also agreed that 20% of that expenditure should be devoted to collaborative research, but the current figure is actually less than 10%. Similarly, the EU Policy Framework for Systematic and Long Term Defence Cooperation (2014) - or even, for that matter, the Code of Conduct on Pooling and Sharing (2012) - has yet to be translated into consistent decisions and actions at the national level. The scope for improvement, in other words, is huge.

3.2 WHERE THE MAIN CHALLENGES LIE

In an era of more constrained budgets, many expected that more collaboration would become inevitable, so that limited funds could be spread further, allowing more effective procedures to be adopted and more capabilities to be kept on-shore. In reality, the opposite is demonstrably happening, driven by short-term considerations about maintaining as many national capabilities as possible, as well as by inadequate incentives to cooperate. The risk of this trend is that, when member states finally realise that some technologies are no longer affordable at the national level, it will be too late to launch a collaborative effort because the required capabilities will have dissipated. Given the huge costs of re-developing the relevant know-how, the alternative option of simply buying ready-made solutions from abroad may then become hard to resist - thus further weakening the EDTIB.

Neither the EU nor specifically the EDA have the resources or the mandate to address this threat to Europe’s defence industrial capabilities. Capability priority definition at the EU level is mostly carried out by the EDA but, despite its efforts to identify objectives that could be beneficial to all, it has yet to engender the required behavioural change. Moreover, budgetary constraints and missing links to the next steps in the capability development process (including implementation) greatly limit its ability to come up with long-term perspectives, which is further hampered by the different planning and acquisition cycles of national MoDs.

While strengthening defence-related research seems to rank high on the official agenda of most European MoDs, in practice it remains a difficult task for them to fulfil. Funding is difficult to mobilise and insufficient for credible R&T programmes, making capability development harder and slower to achieve. The same issue is present

at the EDA, as the agency relies on member states to fund joint projects. As a consequence, most EDA activities have been limited in scale and/or addressed technologies that are not always central to the core defence capability areas, with sometimes unsatisfactory results.

The large disparity in member states' defence R&T funding - with France, Germany and the UK accounting for roughly 85% of the EU total (but only 45% of the overall population) - also makes it difficult to collaborate transnationally, except among states with similarly sized budgets or when one state takes on a clear leadership role and others act as subcontractors for niche technologies. Moreover, at the national level, R&T funding is also often used as an instrument of industrial policy to ensure the long-term sustainability of defence technologies and related industries.

This means that any decision on whether to collaborate in a particular area of defence research is only taken after balancing national interests and technical leadership goals against the costs of developing the capability alone or the potential benefits of collaboration (such as cost and risk sharing, or tapping into partners' pre-existing research). Consequently, despite the enormous reservoir of knowledge that Europe has in defence technology, limited cross-border research activities contribute to its sub-optimal utilisation, with multinational collaborative research in this field counting for less than 10% of total EU expenditure and often directed at interoperability-focused technologies rather than core capability areas. The incentives for more structural cooperation in defence R&T and capability development are simply insufficient.

This also comes, at least in part, from the lack of a single EU mechanism with a sizeable budget to coordinate and fund multinational defence research programmes - whether capability-driven (top down) or technology-driven (bottom-up). The technology push factor should indeed be fully incorporated, if anything because new security threats may also come from the unexpected use of existing technologies in civilian applications for hostile purposes - as has been the case with IEDs (Improvised Explosive Devices) and the GPS itself, not to mention online communication applications.

In Europe, the use of capabilities lies with the member states, each of which can choose between national development, transnational collaboration and off-the-shelf procurement. Confidence in multinational collaboration, however, is still undermined by the perception that it often creates long delays and adds extra costs. In reality, there have been many successful examples of collaboration at the European level, but they tend not to generate media headlines. And, in fairness, there are also many examples of national projects that have suffered delays and overrun budget projections.

Box 4: Research programme coordination and support in the US

In the US, this function of coordination and support of research programmes leading to (or countering) new technologies is in part fulfilled by the *Defense Advanced Research Projects Agency* (DARPA).

With an indicative average annual budget of 3 billion USD and little more than 200 personnel in total, it is not the main funder of defence technology research in the US; instead, it focuses on short- to medium-term projects run by purpose-built teams and reports directly to senior Department of Defense (DoD) management. Its mission statement has evolved over time - the agency was first created in 1958, in the wake of the launch of Sputnik by the USSR - and it is now focused on supporting technological breakthroughs as part of the overall US R&T effort, especially on preventing disruptive technological surprises by potential adversaries.

While the model it represents cannot be directly implemented in the EU, it could be learnt from in order to tailor a mechanism that addresses the innovation aspect of Europe's specific defence research challenges.

It is therefore essential that future collaboration learns from - and builds on - the huge body of experience that has accrued in Europe, and is launched in accordance with the best practices of the most successful programmes. Cooperative programmes could indeed be big success stories - and prove even more efficient than national programmes (as was the case with missile systems) - provided a more systematic and long-term policy framework is adopted and some basic principles are followed. These should include:

- A genuine harmonisation and coordination of operational and military requirements, fighting off the temptation to add national specifications or to over-specify requirements
- The empowerment of the selected industrial prime contractor to lead the endeavour
- A truly collaborative approach capitalising on synergies across the industrial base, utilising existing skills, and limiting duplication

In this context, even the core instruments already in place at the EU level to support civilian and military research could be better used to boost European dual-use R&T. The current framework for security research within *Horizon 2020*, for instance, is providing only limited support even to dual-use projects, even in those pillars such as 'Border and External Security' where the technology required can be similar to (or derived

from) that used for defence capabilities, thus missing out on opportunities to enhance interoperability between civil protection and military forces. These instruments may also need to be refocused, adjusted and better coordinated if they are to produce any significant benefits.

Finally, the Lisbon Treaty itself enshrines provisions – in particular those on Permanent Structured Cooperation on defence (art. 46 TEU and related Protocol) – which could constitute, if and when implemented, additional institutional enablers for long-term joint efforts in this domain.

3.3 WHERE EU FUNDING CAN BRING ADDED VALUE

Given the growing challenges among member states to develop capabilities autonomously, as well as their limited propensity to cooperate, there is merit in determining whether an EU-funded defence R&T programme might help address the current difficulties.

The budget for such a programme should arguably support the key capability needs and promising technological opportunities that are most pertinent to sustaining Europe's strategic autonomy. It should also help discourage unnecessary duplication by member states, which could otherwise continue (or opt for) developing separate national solutions. This, in turn, could generate a beneficial multiplier effect by enabling national efforts to go further and sustain capabilities in multiple sectors.

To this end, the scale of such an EU-funded programme should be sufficient to trigger cooperation in multiple core capability areas in parallel. Its budget should be large enough to make a real difference, but without leading the member states to further reduce their national defence budgets. A tailor-made approach is required to maintain (and possibly increase) the level of national investments in R&T while also bringing to bear the Union's added value and potential multiplier effect.

In other words, the EU-funded defence research programme should be *complementary and supplementary* to national R&T defence priorities and spending, taking into account bottom-up innovation processes and acting as a force multiplier, so that collaborative spending can be seen to deliver more value than at present and help reverse the recent spiral of declining national budgets combined with declining multinational cooperation.

It should also factor in an incremental learning process, especially in terms of better communication and information exchange. This, in turn, would help build trust among stakeholders and ultimately mitigate the potential antagonism between national and

cooperative R&T schemes, favour cost-sharing agreements (even in areas where national programmes initially prevailed), and consolidate transnational centres of excellence. What is often seen as a zero-sum game could well evolve into a positive-sum game.

At the EU level, only the *European Commission* has the capacity to allocate substantial resources – through the Multiannual Framework Programme referred to in art. 182 TFEU – to establish such a comprehensive defence R&T programme at a sufficient scale over time. For its part, the *European Defence Agency* is the only EU organisation with the mandate to define collective capability plans in coordination with the national MoDs and to engender multinational cooperation in this domain, including research. Although its success in achieving the latter has been limited so far (largely due to member states' reluctance), the EDA remains the most logical vehicle to define and review capability priority plans driven by strategic autonomy considerations, as it has experience working with national MoDs and can draw on relevant expertise.

Such plans should be long-term, identifying the core capability needs that will enter service in the 2030s (and which should be developed collaboratively), and enabling critical technologies that will have to be developed in the 2020s (and which can be supported by the EU defence R&T programme). They will have to fully take into account the values and principles enshrined in the EU treaties (notably art. 2-3-21 TEU) as well as relevant national and international legislation. This would also provide more clarity to the industry and more visibility to joint initiatives.

The ultimate goal of the EU-funded defence R&T framework programme should be to support the early phases of future strategic projects (beyond the four already identified by the December 2013 European Council) as well as selected demonstrator programmes (in order to bridge the gap between research and development in the procurement process). More generally, findings and results should be supported which are meaningful enough to stimulate subsequent multinational and national development acquisition programmes (step 3).

Such a programme would thus positively influence the whole sequence of capability development, from definition and planning via R&T through development and production to implementation (step 4). It would eventually lead to capabilities hosted by cooperating MoDs, supported by a strong competitive EDTIB, and geared to address threats to Europe's security as well as mitigate risks. It would also provide an opportunity to make the EU a more credible and reliable security enabler - one that protects and promotes European values and interests in a rapidly changing global strategic environment.





Chapter 4

Scope, governance and modalities of the Preparatory Action

Defence R&T programmes are essential building blocks in the development of products and systems that are ultimately used in deployed military capabilities. At the national level, defence R&T underpins basic capability development and is often used as an instrument of industrial policy to ensure the long-term sustainability of defence technologies and industrial know-how, or simply to acquire knowledge on given topics and get the best value for money in procurement processes. Defence R&T investments made today will underpin the freedom of action available tomorrow, the preservation of operational and technological advantage, and the reinforcement of industrial competitiveness – in short, they will safeguard Europe’s overall security and prosperity.

Box 5: Pilot Project on CSDP-related defence research

Following an initiative of the European Parliament, a *Pilot Project* on CSDP defence research has been established in the 2015 EU budget with a view to continue in 2016. The Pilot Project is a first opportunity to test some modalities of the planned PA in 2017 which, in turn, would pave the way for a possible “future defence research and technology programme” as agreed by the European Council on 25/26 June 2015. The scope of the funding remains modest with €1.5 million committed for 2015 and 2016. However, it is the first time that the EU budget has funded R&T activities focusing on defence and military applications.

The Pilot Project (PP) covers two activities related to defence technology research. It will test and assess the EDA’s capacity to implement research projects in this area with EU funding and to manage EU budget appropriations. In agreement with the European Commission, the EDA will implement a small number of R&T projects in two fields: one technological development project with potentially disruptive implications on future operations and one activity linked to certification for military and civil uses.

The Preparatory Action (PA) is essentially the testing ground for a dedicated EU defence-related research programme as well as a direct follow-up to the Pilot Project (PP) on CSDP-related research, which has already been allocated €1.5 million over the fiscal years 2015-16. As such, both the PA and PP will need to demonstrate the added value of EU-funded cooperative defence R&T projects. By complementing and supplementing the efforts of member states and the EDA, their aim is to demonstrate how EU funding can stimulate and accelerate the development of future capability-supporting systems at the European level. Along with the PP, the PA is therefore an initial tool designed to promote synergies and collaboration as well as to boost the further development of its most promising results. The ultimate goal is to pave the way - on the basis of a positive evaluation by member states - to a fully-fledged EU-funded Defence Research Programme (EDRP) which would be set up within the next Multi-Annual Financial Framework (2021-2027).

As it addresses defence-related research with the EU budget on a limited timescale, the PA will initially follow the EU framework that is already set - i.e. Horizon 2020 - while taking into account the specific nature of the defence sector. In other words, it is essential to choose an approach for this PA that is fundamentally in line with the current tested procedures but also permits to explore the most appropriate solutions for the future EDRP in terms of scope, governance and modalities. Building on the model chosen and put into practice by the PA, the subsequent EDRP will have the possibility to consider tailor-made and, if appropriate, alternative governance schemes.

4.1 SCOPE: DEFINING THE OBJECTIVES

The PA and the future EDRP represent a unique opportunity to help strengthen Europe's defence capabilities and thereby sustain its strategic autonomy. Both also offer a chance to foster European military and industrial cooperation through the added value that direct EU funding can generate, in particular by:

- Addressing the current decline in European defence R&T by boosting investment
- Addressing core future technology needs where economies of scale exist and reducing duplication
- Strengthening the long-term competitiveness of the EDTIB throughout the supply chain
- Building on significant European competences, including the innovative potential of SMEs
- Complementing and supplementing existing national and collaborative efforts

Another key objective of the PA is to test the catalytic potential of the future programme for new collaborative projects. The programme needs to be sufficiently attractive to overcome the current obstacles and disincentives to cross-border cooperation at the European level, both in terms of innovation and capability support. At the same time, the future EDRP should address core defence systems, not just peripheral technologies, and consider what essential defence products Europe should still be able to develop and produce in 20-30 years' time and which of these are at risk of no longer being affordable due to the ongoing loss of skills and capabilities. In addition, breakthrough and disruptive technologies that could be used to enhance Europe's defence capabilities and freedom of action should also be explored.

For the PA to become a real game changer, however, it is essential that the research rests upon sound market principles. Its results must have market potential, be cost-effective and boost industrial competitiveness together with cooperation.

Setting priorities

In order to prove the added value of EU-funded defence research, the PA should define broad priority areas which address shared military needs and have a tangible functional link with EU policies. Each of these areas should then be broken down into one or several specific research domains which, in turn, should be complementary to activities already covered in other research programmes – be they addressed at the national or at the EDA level. These domains should thus result in different research topics that will define the research agenda that the Commission is expected to articulate in the dedicated Work Programme.

What is essential in this respect is the preliminary identification of the broad research areas and topics that need to be developed first, relying on input from all the relevant stakeholders. This would ensure that R&T suggestions are not only linked to member states' priorities and their willingness to cooperate in particular programme areas, but also driven by overarching goals and agreed objective selection criteria rather than by vested interests and backroom deals. It is also crucial that the selected research areas are not of secondary strategic importance and thus, ultimately, peripheral in the EU context.

A wide variety of possible priority areas has already been suggested for the PA, starting with the 16 enshrined in the 2014 Capability Development Plan, covering force protection, information superiority, ground-breaking technologies, autonomous systems, cyber-defence, maritime surveillance, supply chains as well as interoperability and common standards to support CSDP missions and operations. However, in order to avoid unnecessary duplication, the required prioritisation process will have to take into account the areas that are already covered by the EDA or other funding schemes and for the longer term EDRP, to consider what core capabilities will be considered essential for 2021 onwards.

Type and size of projects

As the objective is to lay the groundwork for future capability development programmes, the PA should put emphasis on two main categories of projects: *capability-driven* research addressing commonly agreed needs, and *innovation-driven* research focusing mainly on those areas – such as ITAR – where Europe risks becoming too dependent on other countries (with implications on its freedom of action, security of supply and industrial competitiveness). In this context, the participation of innovative SMEs should be particularly encouraged.

The projects to be supported by the PA should therefore be launched in fields where European industry has the innovation and manufacturing skills necessary to develop cutting-edge technologies and where cooperative programmes are needed in order to rapidly implement technology demonstration programmes. Projects should also consider addressing short-term interoperability gaps and performance standards development, which are all crucial for increasing cooperation between member states in these domains.

Considering its short-term nature, limited budget and trial character, the PA should mainly be used to test different categories of research activities. In particular, the PA should aim at striking a balance between projects with various Technological Readiness Levels (TRLs) – through both small and larger projects, bottom up and top down, for demonstrators and emerging technologies. For instance, cyber-defence projects are more likely to have a low TRL (3-4) and to be relatively small, while projects contributing to a demonstrator (e.g. air systems) would have higher TRL goals (5-6) and be of larger size. This will facilitate an informed assessment of how best to manage a long-term follow-on defence R&T programme. Finally, PA-funded projects could also include limited *ad hoc* consultancy and feasibility study assignments to address issues that require further attention in view of the future EDRP.

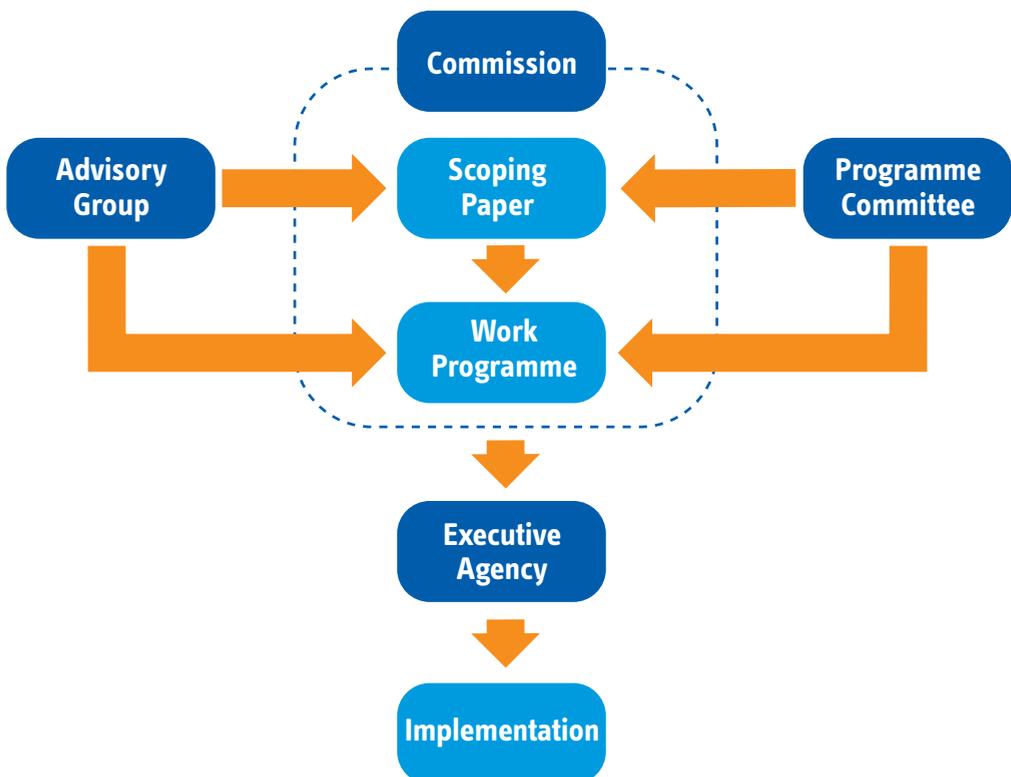
This approach seems appropriate in view of the need to minimise fragmentation while focusing resources on well-identified shared priorities as enablers for potential future common projects. It would also be preferable that a significant share of the PA budget be allocated to just a few demonstrator development actions, as these would provide visible benchmarks and tangible outputs with clear short-term defence operational applicability. For similar reasons, linked also to the timeframe of defence industrial projects, it would make sense to earmark the total required funds for all three years, even if the precise annual allocation remains subject to formal annual approval.

4.2 GOVERNANCE: DEFINING THE STRUCTURE

All stakeholders need to be represented in the governance of the PA and must be able to provide their input into the decision-making structure: the member states' MoDs, the industry, defence-related research organisations, European institutions and bodies, and academic experts with relevant knowledge. However, EU-funded defence-related research is both new and unique when compared to other research domains in which EU funding is already in place.

Therefore, some governance rules and modalities that are currently in use for Horizon 2020 will have to be adapted to the specific requirements of defence-related research. It is the task of the Preparatory Action to test some solutions and gain experience that could then help to set up a suitable governance structure for the future EDRP. Such rules and modalities need to be consistent with existing defence R&T activities performed at both the national and international levels.

FIGURE 3: PA GOVERNANCE IN A NUTSHELL



Programme Committee

In accordance with the procedure already in force for Horizon 2020, one key role within the decision-making structure is to be played by the Programme Committee (PC). Its function is not only to provide strategic orientation at the earliest stage of the process (through the Scoping Paper), but also to give input on the drafting of the Work Programme, to approve it and, finally, to launch the projects that have been selected.

The Programme Committee for the PA, which is to be composed of member state representatives, will have the responsibility to prevent unnecessary duplication between national efforts, NATO actions, and renewed EU efforts in other domains such as the civil side of H2020 and the current programme on security research. Its role will be essential precisely because member states are the sole end-users in the defence domain. Its appointees must therefore have a balanced understanding of wider strategic objectives and defence research priorities, from both a national and an EU collaborative standpoint. In that respect, the PC will play a key role in the evaluation of the EU added value of projects. This means that ideally, the representatives should come from defence ministries at the senior policymaking level. It is also standard practice to endow the Executive/Implementing Agency with an observer role in the PC. In that respect, member states should ensure that their representatives in the Programme Committee and those in the EDA are in full sync with each other.

In the so-called ‘comitology’ system, the European Commission always chairs the PC. It does not have the right to vote but plays a key role in ensuring the added value of the EU-funded research activities and their link to EU policies and objectives. This should apply to the PA as well. And, in this case even more than in the others, the Commission should also act as a consensus-builder in order to avoid the over-representation of national interests, the unnecessary duplication of efforts, and the tendency of countries to seek to protect their own domestic defence industrial sectors. These would actually go against the spirit and the core objectives of the PA.

Advisory Group

In order to develop clear strategic orientations for the Work Programme through the Scoping Paper, the Programme Committee should take into account the views of other major stakeholders, namely the defence industry, defence experts with relevant knowledge from the scientific and think tank community, Research Technology Organisations (RTOs), the EEAS through its specialised departments as well as the EDA itself. These groups should be represented in a dedicated Advisory Group, which is a regular feature for other EU-funded research programmes, with the role of providing

strategic guidance, gathering expertise and offering advice on the direction the PA should take at every stage in the process.

In general, the structural dialogue on road-mapping between the industry (the final supplier) and the member states (the trusted customers) should carry substantial weight and be appropriately reflected in the governance model. This could ensure that the research projects have both real-world added-value and genuine market potential. European associations like the ASD could provide valuable input for the selection of stakeholder representatives. Some research institutes specialised in defence matters are also relevant players with considerable insight into defence priorities, capability-related needs and potential technological solutions. Their involvement can also contribute to identifying relevant next-generation technologies and possible breakthroughs. For its part, the EEAS could provide valuable input on the needs identified through CSDP activities.

Today, the main EU-level body engaged in defining defence capability and research priorities is the EDA - through instruments like the Capability Development Plan, the Strategic Research Agendas and the CapTechs. Building also on the experience made with the PP, it is therefore logical and appropriate to involve the EDA upstream in the preparation of consolidated input from the Advisory Group to feed the Work Programme. This will help avoid unnecessary duplication and ensure consistency and complementarity between priorities and projects established in the EDA framework and those funded through the PA.

For defence research, a closer dialogue is needed between customers and providers of defence technologies. This is true for the PA but even more so for a fully-fledged follow-on R&T programme, which would need long-term strategic guidance (including relevant scientific expertise and operational experience) and multi-annual research roadmaps. This specific need should be adequately reflected in the mandate of the AG and, no less importantly, be taken fully into account in the preparation of the follow-on EDRP.

For all these reasons, a more inclusive and tailor-made Defence Advisory Group (DAG) should assume the function of the traditional AG in the framework of the PA, further underlining the specificity of the defence domain - without prejudice, once again, to the governance structure that may be adopted for the EDRP. Therefore, while being focused on providing input and advice to the Programme Committee, the DAG should also have the possibility of contributing to the overall review of the PA's operation as well as the discussion on the future research programme for 2021-27. This would also be consistent with the logic of using the PA as a testing ground in terms of scope, governance and modalities.

Work Programme

The Work Programme (WP) will be the backbone of the Preparatory Action and the subsequent EDRP. In the ‘comitology’ system, the WP would be drafted on an annual basis following an iterative process between the Commission and the Programme Committee, and it would be based on a so-called Scoping Paper (SP) which builds on the input of, among others, the Advisory Group - the DAG in the PA - and the Programme Committee.

The Scoping Paper is a crucial step for the PA, as the Work Programme should ultimately act as an incentive to cooperate as well as a disincentive to act alone if other countries are prepared to work together and are hence deemed eligible to receive EU funds. However, realistically speaking, it is likely that only one or maximum two SPs/WPs would be prepared within the PA’s time frame.

Finally, in light of the strategic direction and the objectives enshrined in the SP, the Commission should be in charge of drafting the Work Programme, thereby taking an approach similar to H2020. The draft would then be presented to the Programme Committee for adoption through the usual ‘comitology’ procedure between the Commission and the member states.

Executive/Implementing Agency

In Horizon 2020, after being adopted, a Work Programme is normally implemented by an Executive Agency, which is in charge of preparing the calls and implementing the contracts in light of the ranking established by the evaluators. In the PA, the selected agency would be entrusted with the powers delegated by the European Commission: a Delegation Agreement would thus have to be signed between both entities in order to define more precisely which responsibilities the Executive Agency would take over.

The European Defence Agency (EDA), with its mandate and expertise, is the most natural pick to play the role of the Executive and Implementing Agency, while the European Commission would monitor the progress of the programme and the member states would control the implementation process and have the final say on the approval of the selection within the context of the PC.

Therefore, the EDA will have to take the necessary steps in order to meet the PA’s specific administrative requirements, also building upon the experience made through the Pilot Project. Moreover, the EDA will be expected to set up a structure dedicated to the dissemination of the output of the research projects – in accordance with the appropriate Intellectual Property Rights scheme agreed for each project – to potential applications and follow-up processes. An exchange of information on quality is likely to increase the effectiveness of existing capability development plans and strategic research agendas.

4.3 MODALITIES: DEFINING THE RULES

Due to the uniqueness of the defence sector, it is also necessary to outline some key principles which should be respected in the technical provisions of the governance structure. However, it is envisaged that technical modalities – as well as significant parts of the governance structure that are used for the PA – will need to be adjusted for the future programme as and where necessary.

Experts for the evaluation

Evaluation is a key element in all the projects financed under H2020, and it should also be for the Preparatory Action. Concretely, the Executive Agency (the EDA, in this case) would be in charge of establishing a list of independent experts through a call addressed to the member states (their MoDs, in this case), which would then submit their candidates. The resulting list would then have to be formally approved by the Commission.

These experts would be in charge of evaluating proposals and would therefore have to be chosen according to a set of agreed criteria. The most important are: proven professional skills, defence domain experience, technical knowledge as well as relevant geographic diversity. As it is a standard feature of defence R&T projects that the end-user carries out the evaluation, the list of experts should also be presented to the Programme Committee for approval. Particular attention should be given to potential conflicts of interest that would be detrimental to the evaluation process.

The EDA would then have a broad list of experts from which to create shorter ones for specific calls and topics to submit, yet again, to the Commission for formal approval. Such lists, which should always include at least one MoD representative, would not be made public.

Selection process

After a shortlist has been established, the selected experts would start the proper evaluation of proposals, relying on an agreed set of criteria to be used. In this respect, the Horizon 2020 methodology offers a template that needs to be adapted to the specificities of defence R&T in the PA. The criteria of *scientific excellence, impact, quality* and *efficiency of implementation* used under Horizon 2020 will have to be tailored to this unique domain.

For instance, the scientific excellence criteria should also reflect the degree of *strategic relevance* – regarding both the CSDP overall and European defence industrial capacities – that is needed to ensure the envisioned level of autonomy. Secondly, this should

be strongly linked to *EU added value*, i.e. the comparative advantage of carrying out a project through the EU and European partners rather than nationally. This particular criterion could encompass: a) complementarity in areas where member states can no longer credibly afford to act alone (e.g. economies of scale or potential disruptions); b) the capacity of the technology to generate economic advantages for European industry; c) the development of European skills, including within the supply chain.

Thirdly, the impact criteria should cover the *member states' market uptake*, i.e. the potential to catalyse collaborative programmes and to use the technology rapidly after the R&T phase. Fourthly, the quality criteria could be adapted to take into account the TRL and feasibility of the targeted technology and the *innovative potential* of each project. Finally, the *European value for EU money* principle could be explicitly mentioned as a part of the efficiency criteria and anchored to sound economic thinking.

Participants and levels of security

Under Horizon 2020, projects are open not only to member states but also to associated countries outside of the EU. However, as the overarching goal of a defence R&T programme would be to help Europe protect and defend its citizens and its interests by maintaining its EDTIB in key capability areas, the broadly inclusive setting adopted under H2020 seems unfit for the Preparatory Action. Consequently, only legal entities in the 28 EU member states should be eligible to participate. As an exception, third countries that are already strongly involved in collaborative defence research, such as Norway, could be accepted on a case-by-case basis, provided the appropriate security arrangements are in place (e.g. for the protection of classified information). This should at least be the modality to be adopted for the PA.

The participants can be public authorities, industrial organisations (public and private), institutions of higher education and research organisations – provided they are all registered in the EU and approved by the respective MoD, and that there is a minimum of three participants coming from three different member states.

Participants forming a consortium and coming from three or more eligible European countries would likely need to exchange controlled sensitive information. Transfer of know-how in the defence field is controlled by member states' competent export authorities, which should be encouraged to streamline information flows for these types of collaborative projects.

Previous experience shows that it is extremely difficult to define a 'European company'. For example, in a market that is increasingly global, it may prove unrealistic to require that the shareholders are predominantly European. Similarly, it could prove misguided

to require that the company's headquarters is in Europe, since some offshore companies may own European subsidiaries that are significant and well established players in a specific sector. In that respect, it may be worth considering the so-called 'proxy regimes', which are common practice in the US as a source of inspiration.

The PA could therefore set a number of eligibility criteria about the participant's ability to a) carry out defence-related projects in Europe (existence of adequate and significant on-site development facilities); b) meet adequate security of information and security of supply requirements; and c) ensure effective control inside of Europe of the technologies developed (through a technical design authority).

This could be complemented with an additional contractual obligation that imposes limitations on subsequent transfers of results generated during that project outside of the EU. Such restrictions would ensure that control over the results of EU-funded research remains in the EU, irrespective of any change in company ownership, although the results could still be exported as finished products.

Last but not least, all the researchers involved in a project would have to hold the necessary security clearance from their national authorities. While the PA Work Programme and the resulting calls would probably have no classification, at least some of the proposals submitted (and the results of the projects) could, and it would be up to the PA to determine the appropriate security levels. Especially if the follow-on programme is to address core defence technologies, the WP may well lead to classified information being provided during the calls. It will remain to be defined – on a case-by-case basis – what level of security clearance would be required to access such information. The same applies to the proposals or tenders submitted.

Funding practices

Under Horizon 2020, the EU provides funding at levels between 70% (with the remaining 30% from the participants) and 100% of the eligible direct costs, plus an allowance of 25% for so-called additional costs. This is significantly different from the standard public financing model for defence research worldwide, which is normally close to 100% of true costs. At the national level, governments control the defence research budget and determine where and how it is spent, and whether the research is then taken further or exploited. This means that the industry has no control and little visibility of the future market; private companies would therefore struggle to develop a robust business case to invest significantly in defence R&T. This is another distinctive feature of defence research when compared to the civilian sector, where companies both forecast and shape the market and can justify taking predictable risks with regard to returns on investments.

This is why, when it comes to project funding, the Preparatory Action should seek to provide full 100% coverage of the eligible direct costs and a percentage higher than 25% for additional costs which should surely be no lower than that of non-EU competitors.

One option that could be explored, especially for the future follow-on EDRP is the possibility for member states to provide additional contributions for some actions. Member states could also contribute in kind by giving access to their research facilities and platforms. This would further strengthen member states' commitment to capitalising fully and systematically on the results of the R&T phase, particularly for demonstrator projects with a TRL above 3. Such arrangements would also provide a strong incentive for the grantees and national governments to seriously commit to the R&T projects. This would also increase the likelihood of having the research focused on core, not peripheral projects, and of the results being further developed. In that case, however, it should be specified that this budget commitment would not have a detrimental impact on national defence budgets.

Use of information and IPRs

A crucially important aspect of the contractual scheme implemented for the Preparatory Action is the approach to ownership and the use of information, which is normally associated with Intellectual Property Rights (IPRs). While there is a legitimate interest among member states to make use of the results, there are equally understandable sensitivities in the defence industry over the risk of disseminating leading-edge defence technologies beyond those directly involved in the research. Member states are also keen on ensuring that suitable controls are in place to avoid the dissemination of sensitive and classified defence information. This means that, unlike under H2020, it would be much more difficult to pursue the goal of widely sharing detailed results with non-participants.

Given the particular nature of the market for defence goods, it is essential that the IPR regime is made attractive enough to encourage European industry at all levels and stages of the supply chain to apply for EU funding. The main problem for the industry is that IPRs have a critical impact on innovation, competitiveness and profitability. Large defence companies in particular accumulate extensive background IPR and associated know-how over the course of many years, much of which is used to steer and refine new foreground research activities. Therefore, in order to promote the competitiveness of the participants in a project and make sure that its outcome can be used in future development, foreground and background information must be regulated properly, with a view to protecting the interests of industry participants.

At the same time, any EDRP must deliver EU added value, i.e. foster cooperation and facilitate follow-on procurement by as many member states as possible. On this basis, a balanced approach to IPR could have the following features:

- (1) Foreground IPR should be vested in consortium partners in the case of grants
- (2) Participants' background IPR should be protected, with access only for consortium partners being documented and agreed at the outset by each partner
- (3) Recipients should be required to make a package of information available to the EU and the member states explaining the aim of the research and summarising the results achieved, as well as clarifying its potential military application and likely exploitation plans

This will help spread an understanding of the nature and potential applicability of the defence research being undertaken, and promote subsequent take-up of the project's outcomes in further research or product development – both within and beyond the countries whose industry is involved in the initial research.



Chapter 5

Beyond 2020: towards an EU-funded defence research programme

5.1 THE EU AS A GLOBAL PLAYER

The European Union is a global player with global interests and responsibilities. Being an effective player, however, requires capabilities in critical military areas and an appropriate level of strategic autonomy, freedom of action and security of supply. Adequate strategic autonomy can only be obtained and preserved through sustained investment in research and development to ensure that European countries' armed forces have access to the kind of in-depth, system-level know-how that can only be acquired when cutting-edge military capabilities are developed domestically. Achieving an appropriate balance of strategic autonomy is therefore vital to ensuring security for all European citizens.

Advanced defence systems and technologies are rapidly spreading around the world. In order to maintain its ability to project force globally, the United States has announced that it will embark on its 'Third Offset Strategy' (3OS), also known as the Defense Innovation Initiative. By harnessing innovative defence and dual-use technologies in such areas as robotics, autonomous systems, 3D printing, big data and extended-range and low-observable air operations, the US aims to preserve its military-technological superiority into the future. Yet the 3OS comes on top of ongoing long-term efforts in more classical R&T topics covering all the main weapons systems; their combined effect risks widening the gap with Europe even further. All this should stimulate Europeans to change their approach to investing in defence technologies, while Washington's shift of strategic focus to other theatres – in particular the Asia-Pacific region – should force the EU and its member states to take up more responsibilities in their neighbouring areas.

The potential gap, however, does not concern solely the US. China, Russia, and even South Korea have maintained and increased their efforts in the most critical weapons systems and enhanced their demonstrators policies, and thereby their overall competitiveness.

Today's European defence industrial capabilities remain significant, largely as a result of past investment in defence R&T. However, in the future (and in part already today), no individual EU member state will be able to sustain a national defence industrial base with the capacity to develop and produce the full range of military capabilities. As new defence technologies are being developed worldwide, the need for cross-border collaboration is bound to increase further. In that respect, the PA and the follow-on EDRP would contribute to shaping a shared European perspective as the best way to make use of both the budgetary resources and the economies of scale required to reinforce Europe's ability to keep up with the US and remain competitive worldwide. Cooperation between European companies and member states can be tangibly facilitated and energised by such schemes, which would also benefit from streamlining the existing processes for developing the technology roadmaps with a view to better identifying timelines, objectives and priorities for the different areas.

A comprehensive multi-annual EU-funded Defence Research Programme (EDRP) would indeed be a key factor not only to ensure an appropriate degree of strategic autonomy, freedom of action and security of supply, but also to contribute to transatlantic security cooperation and interoperability in (and through) NATO. In fact, R&T is a stage in the overall capability development chain. Joint capability development activities between the US and Europe will be much more viable and equitable if both sides are on reasonably equal technological levels. In order to achieve that, the scale of the future EDRP will have to be credible in terms of both size and scope, also in order to mobilise adequate budgetary means for greater investment – a goal that also needs to be matched by sufficiently high member states' R&T budgets, to which they committed at the 2014 NATO summit in Wales. The development and maintenance of defence systems in support of relevant capabilities is characterised by high costs and long cycles which both require and encourage substantial investments – hence the need to explore all possible funding and implementing options for the future.

As the first framework ever for European countries to cooperate on defence R&T with EU funding, the Pilot Project and Preparatory Action (PA) will also represent an important testing ground for the future multi-annual programme in terms of types of projects, model of governance and functional modalities. It will permit the evaluation of what is promising, what is already working, and what may need further adjustments in view of the launch of a large-scale, long-term research programme.

5.2 THE NEXT STEPS

Following a thorough review of the PP and the PA, the subsequent long-term programme should consider the possibility of integrating other modalities into its structure and operation. It should thereby build on previous experience in other EU activities (such as ECSEL or the Single European Sky) through public-private partnerships and co-funding arrangements tailored to the demands of the stakeholders. In this regard, Joint Undertakings and Joint Technology Initiatives are tested mechanisms that could be modified and adapted to suit a defence R&T programme, with a view to promoting an integrated approach involving representatives of the Commission and other EU bodies (namely the EEAS and the EDA), national MoDs and the defence industry. These arrangements could also come to encompass more complex schemes like Pre-Commercial Procurement (PCP) that could not be included in the scope of the PA and would, at any rate, require *ad hoc* modalities for implementation in this field.

Yet there is also additional conceptual work to be carried out in order to shape a suitable and sustainable governance model. How should research priorities be defined over time (i.e. by whom and based on what critical scenarios)? What balance should be kept between security-driven and market-driven considerations? How should multi-annual R&T roadmaps be developed and calls framed? How can market uptake of research results by member states be ensured? How can companies from 'friendly' third countries whose technological know-how is deemed essential be associated and possibly involved in the programme? And since many relevant systems have a very strong dual-use character, how should defence-related and other R&T EU-funded programmes be linked and aligned? How can the spill-over or trickle-down effect between military and civilian technologies be ensured and even encouraged?

In this respect, the *Group of Personalities* is ready to assist and provide input and advice both throughout the PA and beyond, possibly in the form of a 'European Defence Advisory Board' (EDAB) to be created with the launch of the PA. This board would have the mission to advise on the Commission's Defence Action Plan, to give strategic guidance on the principles, structure and modalities of the EDRP, and to inform its research agenda. Accordingly, the EDAB should have direct access to the highest EU institutional levels to ensure that a) the proposals formulated in the Commission's Defence Action Plan are coherent and in line with the objectives assigned, b) the EDRP is developed in harmony with the EU Global Strategy and its defence-related follow-up, and c) the defence specificities of the EDRP are duly taken into account in the preparation and negotiation of the next MFF.

In parallel to the Pilot Project and the Preparatory Action, other initiatives are also expected to address the challenge of Europe's strategic autonomy and factor in the defence R&T component. The European Commission's forthcoming Defence Action Plan is a crucial case in point: as the first such initiative based on EU funding, it highlights the growing importance of mobilising all the available EU instruments (regulation, funding, policy proper) in support of defence in order to foster European defence cooperation.

In this context, it would also be desirable to explore how best to connect the PA with other ongoing efforts in the industrial and technological domain, such as through common structural policies, as well as with other current EU-funded research programmes. In particular, this could include exploring innovative ways of financing relevant projects, for instance through the European Investment Bank (EIB) or dedicated regional funds to support control and test centres and other relevant facilities.

Last but certainly not least, the new EU Global Strategy (EUGS) on foreign and security policy is expected to frame the overall vision and level of ambition for Europe's willingness and ability to shape external events in order to protect and promote its common interests and principles. Consequently, the EUGS should also lay the foundation for follow-up defence-related initiatives which will have to pay adequate attention to identifying the military capabilities and cooperative initiatives required to implement the new strategy. It should also assess the potential need for autonomous EU action and pave the way to a dedicated policy implementation agenda for the years to come, taking also into account the current debates on a possible European defence 'White Book'. This will provide the backdrop for a thorough analysis of the desirability and feasibility of maintaining a sufficient degree of strategic autonomy in key technology areas. The subsequent ranking of technological priorities will be crucial to guide the long-term EDRP.

These parallel policy initiatives should feed and inspire one another, combining top-down and bottom-up approaches towards a comprehensive reappraisal of Europe's strategic priorities and instruments. Adaptation, cooperation and innovation should be the leading principles not only for R&T but also for policy review processes that better respond to the challenges of a rapidly evolving security environment and the demands of an increasingly concerned European public.





Annex



Terms of Reference

INTRODUCTION

The European Commission has invited key personalities from European industry, government, European Parliament and academia to advise it on establishing a Preparatory Action (PA) on Common Security and Defence Policy (CSDP)-related research.

Each member of the Group will contribute his or her views and perspectives to the process. Individual opinions of the Group members, while important to the democratic process and transparency of this initiative, do not necessarily reflect the view of the Group as a whole, or that of the European Commission.

TERMS OF REFERENCE

1. The European Commission, in its Communication on the European Defence and Security Sector¹, proposed establishing a Preparatory Action to support CSDP-related research, not covered by Horizon 2020 funding for civilian part of CSDP. The focus would be on those CSDP areas where capabilities would be most needed, seeking synergies with national research programmes where possible. This was endorsed by the European Council in December 2013.
2. The EU Financial Regulation allows for a PA², which may last no more than 3 years, to be established “... *to prepare proposals with a view to the adoption of future actions.*” The proposal for any PA must be approved by both the European Parliament and the Council of Ministers.

1. *Towards a More Competitive and Efficient Defence and Security Sector* – COM (2013) 542, July 2013.

2. Article 54(2) of the Financial Regulation 966 (2012)

3. It is the Commission's intention that the PA should illustrate the added value of an EU contribution to CSDP-related research areas not covered by the existing Horizon 2020 research programme which has an exclusive focus on civil applications.
4. As stated in the Implementation Roadmap for the Defence Communication; *“if successful this PA would prepare the ground for a possible CSDP-related research theme which could be funded under the next multi-annual financial framework (MFF)³.”*
5. The primary mission of the Group of Personalities will be to help establish recommendations for a long term vision for EU funded CSDP-related research which can add the most value to supporting European defence co-operation. These recommendations shall address the overall scope and governance of future EU funded CSDP research and point out possible collaboration and co-ordination mechanisms. The overarching goal of the PA and CSDP related research is to create a framework that would stipulate collaborative approach to defence among the Member States.
6. The PA shall contribute to delivering capabilities for CSDP, as referred in article 42 TEU, while enhancing the strategic autonomy, technological and industrial potential of Europe. It shall be complementary to CSDP-related research activities in other institutions – especially that of the European Defence Agency – as well as related national research activities of Member States.
7. To this end, the activities of the Group of Personalities will include:
 - Making strategic and operational recommendations for the implementation of the PA in the field of CSDP-related research;
 - Giving guidance for a possible future EU CSDP-research activity beyond 2020, for which the PA in 2017-2019 will act as a test phase, including areas this new research activity should focus on;
 - Proposing an appropriate governance structure for EU CSDP-related research;
 - Proposing guidelines on the modalities, such as confidentiality, funding schemes, designation of experts and intellectual property rights;
 - Giving recommendations on the relationship of the EU CSDP-related research activities with similar activities involving non-EU countries or organisations.
 - Making recommendations on the scope of the PA including identifying a small number of research areas (around 5) which would:

3. *Implementation Roadmap – A New deal for European Defence* – COM (2014) 387 – adopted in June 2014

- test the value added of EU-funding in the area of defence and so prepare the ground for a CSDP-related research theme in the next MFF;
 - address defence capability priority needs for crisis management and in support of CSDP, including missions and operations;
 - support innovation and competitiveness of EU defence-related companies;
 - provide opportunities for European defence companies of all sizes and from all MSs to participate, including research institutes; and
 - promote growth and co-operation within European defence industry sector, including SME cross-border supply chain.
8. The Group of Personalities will be supported by WG of sherpas, with the Commission (DG GROW) ensuring secretarial duties. The EUISS will act as rapporteur for the report.
 9. The Group of Personalities will report their conclusions by 1 February 2016.



Biographies of the Members of the Group of Personalities



Fernando Abril-Martorell

CEO of Indra

Fernando Abril-Martorell is the Executive Chairman of the Board of Directors, Chairman of the Strategy Committee and Chairman of the Management Committee of Indra.

A graduate in Law and Business Administration from ICADE (Madrid), Mr. Abril has extensive financial experience, having served as CEO of Grupo PRISA (2011-2014), CEO of Credit Suisse Spain and Portugal (2005-2011), CEO of Grupo Telefónica (2000-2003) and Managing Director and Treasurer for JP Morgan Spain (1990-2000). He is currently also a member of the Board of Directors of Ence.



Carl Bildt

Former Prime Minister and Minister of Foreign Affairs of Sweden

Carl Bildt is an entrepreneur in future and peace. He chairs the Global Commission on Internet Governance and serves as one of the co-chairs of the European Council of Foreign Relations. He sits on the Board of Trustees of the RAND Corporation, is a Senior Advisor to the Wallenberg Foundations and chairs the World Economic Forum Global Action Council on Europe.

As Prime Minister of Sweden between 1991 and 1994 he was responsible for negotiating and signing the membership agreement with the EU as well as introducing several major economic reforms, paving the way for the successful growth in the decades that followed.

In 1995 he was appointed Co-Chairman of the Dayton peace talks on Bosnia, becoming its first High Representative and later the Special Envoy of the UN Secretary General Kofi Annan to the region.

As Foreign Minister of Sweden between 2006 and 2014 he was a catalyst of the EU's Eastern Partnership and pushed for a new European Global Strategy.

Passionate about new technologies – his e-mail exchanges with President Bill Clinton were the first ever between heads of state in the 1990s – Carl Bildt@carlbildt is a pioneer of the use of social media in international diplomacy.



Antoine Bouvier

CEO of MBDA

Antoine Bouvier was appointed Chief Executive Officer (CEO) of MBDA in June 2007.

From January 2002 until joining MBDA, he was CEO of ASTRION Satellites. Prior to that, he was Executive Vice President in charge of Eurocopter's Commercial Helicopter Division.

In 1990, Antoine Bouvier joined Aerospatiale's Commercial Aircraft Division. In 1991, he became the Division's Director of Strategic Analysis. From 1992 until 1994, he was Secretary General and Industrial Director of the ATR GIE. Between 1994 and 1998, he was ATR's Vice-President Operations, going on to become President of the ATR GIE from 1998 until 2001.

Antoine Bouvier started his career as an auditor at the Cour des Comptes (similar to the UK's National Audit Office). He is a graduate of the Ecole Polytechnique (1980-1983) and the Ecole Nationale d'Administration (1983-1986). He was born in Paris in 1959, and is married with five children.



Håkan Buskhe

CEO of Saab

Håkan Buskhe is the President and CEO of the Swedish defence and security company Saab. He took up his position on 1 September 2010, and has brought to Saab more than 20 years of experience in programme and operations management and business development from national and international commercial industries.

Most recently he served as the President and CEO of E.ON Nordic AB and E.ON Sverige AB. E.ON is the world's largest investor-owned energy company with a European presence that is unique in the energy industry. Håkan Buskhe had extensive experience of the fast-moving Transport and Logistics business. Among other things, he was responsible for Schenker in Europe.

Since spring 2012, he has been a member of the Board of the Vattenfall. He is also a member of the Board of Nefab. Previously, he was Chairman of the Board of the transportation company Green Cargo AB, and has also served as Chairman of the Oskarshamn Nuclear Power Plant.

Håkan Buskhe holds a Master of Science from Chalmers University of Technology in Gothenburg and graduated as Licentiate of Transportation and Logistics. His Master's degree was focused on Mechanical Engineering.



Paul de Krom

Former Secretary of State for Social Affairs and Employment, President and CEO of TNO, a Dutch applied research organisation

Paul de Krom has been Chairman of the TNO Executive Board and Chief Executive Officer since 1 March 2015. From 2014 to 2015 he was Interim Managing Director at the Rural Development Department, a government agency of the Ministry of Economic Affairs. Prior to this he had various board positions, including chairman of the Stichting Nationaal Energiebespaarfonds (to encourage households to save energy) and initiator of the *Techniekpact* (linking education to employment in the technology sector).

From 2010 to 2012 Paul de Krom was Secretary of State for Social Affairs and Employment in the Rutte Cabinet I. From 2003 to 2010 he was Member of Parliament for the VVD party, and spokesman for environment, waste, energy, water, aviation, ports, transport and logistics, infrastructure (roads and public transport), immigration and integration, among others. In the period 1991-2003 he held various HR positions at Shell in Rotterdam, The Hague, the Middle East and London. Born in Zutphen in February 1963, Paul de Krom Studied Law and Public Administration at the University of Groningen. He is married and has three sons. He is Knight in the Order of Oranje-Nassau.



Tom Enders

CEO of Airbus Group

Dr. Thomas ('Tom') Enders was appointed Chief Executive Officer (CEO) of Airbus Group (EADS until 1 January 2014) on 1 June 2012, after having been CEO of Airbus since 2007. He has been a member of the Executive Committee of Airbus Group since its creation in 2000.

Prior to joining the aerospace industry in 1991, Dr. Enders worked, *inter alia*, in the German Ministry of Defence and in various Foreign Policy think tanks. He studied Economics, Political Science and History at the University of Bonn and at the University of California in Los Angeles.

Enders is a member of the BDI Board (German Industry Association, 2009) and the Joint Advisory Council of Allianz SE (2013).



Michael Gahler

MEP, EP Rapporteur for the Commission's Communication on defence

Michael Gahler (CDU) has been a member of the European Parliament since 1999. In the 2014-2019 parliamentary term he serves on the committee on foreign affairs and the subcommittee on security and defence (where he is EPP spokesperson). He was the Rapporteur of the European Parliament report on the European Defence Technological and Industrial Base in 2013. Together with other MEPs he initiated a pilot project on CSDP-related defence research in the EU budgets 2015 and 2016.

Michael Gahler studied law in Germany, with further studies in France, and later joined the diplomatic school of the foreign office (1990-1991), after which he spent two years as desk officer in the department of 'international environmental politics'. From 1993-1995, he was assistant in the international office of the Christian Democratic Union (CDU). Between 1995 and 1999, again with the German foreign office, he was desk officer for the Baltic States and the Council of the Baltic Sea states.



Elisabeth Guigou

President of the Foreign Affairs Commission of l'Assemblée Nationale, former Minister of European Affairs, of Justice and of Employment

Elisabeth Guigou was born on 6 August 1946, in Marrakech, Morocco. She studied American literature and economics before graduating from the prestigious *École Nationale d'Administration* (ENA) in Paris. After a stint at the Ministry of Finance, she became Adviser to the President of the French Republic, François Mitterrand. Between 1990 and 2002, she was a member of the government of Prime ministers Michel Rocard, Edith Cresson, Pierre Bérégovoy and Lionel Jospin as Minister of European Affairs (1990-1993), Minister of Justice (1997-2000) and Minister of employment and solidarity (2000-2002). She was elected to the European Parliament in 1994. She was re-elected in June 2012 to the French National Assembly where she began her fourth 5-year term, following the elections of 1997, 2002 and 2007.

Elisabeth Guigou was Vice-President of the *Assemblée Nationale* (2007-2012) and is now chair of the Committee on Foreign Affairs. She is President of *l'Association Europartenaires*, founded in 1994, and since 2015 of the Anna Lindh Foundation, an inter-governmental institution, which promotes intercultural dialogue between and within societies in the Euro-Mediterranean region.



Ian King

CEO of BAE Systems

Ian King was appointed Chief Executive of BAE Systems in September 2008, having originally been appointed to the Board of Directors as Chief Operating Officer, UK and Rest of the World, at the beginning of 2007.

In 1976 he started his career as a graduate at Marconi and spent the next 10 years in manufacturing in Scotland and Portsmouth. He became Finance Director of Marconi Defence Systems from 1986-92 and of Marconi Electronic Systems 1992-1998. During this time he was appointed a non-executive director of the Canadian Marconi company and director of Marconi's two Anglo/French joint ventures in space and sonar. On completion of the British Aerospace/Marconi merger in November 1999, he was appointed Group Strategy and Planning Director reporting to the Chief Executive and responsible for the initial Strategic Business Plan for BAE Systems.

Ian King was appointed to the post of Group Managing Director for Customer Solutions & Support (CS&S) at the start of 2001 responsible for growing a support and services business in the UK and international markets. In addition to leading the CS&S business, he was responsible for the integration of the Alvis business into a new Land Systems business following its acquisition in September 2004.



Bogdan Klich

Former Minister of Defence, member of the Polish Senate

Bogdan Klich has been Senator in the Polish Parliament since 2011 and is currently minority leader. Before entering the Senate, he was Minister of National Defence (2007–2011) and Member of the European Parliament (2004–2007) where he chaired the Delegation for Relations with Belarus. In the years 2001–2004, he was member of the Sejm (lower house of the Polish parliament). As the Deputy Minister of National Defence (1999–2000) he was responsible for Poland’s cooperation with NATO.

He graduated from the Faculty of Medicine at the Krakow Medical Academy in 1986 and obtained an MA in History of Art from the Jagiellonian University in Kraków in 1987. He is lecturer at the Department of European Studies at the Jagiellonian University and at the Kraków University of Economics.

Senator Klich has authored numerous publications on foreign policy and international security. In 2001 he founded the Institute for Strategic Studies think tank in Kraków. In the late 1970s and 1980s he was active in the democratic opposition movement. Currently, he is a member of regional and central authorities of the Civic Platform political party.



Federica Mogherini

High Representative of the Union for Foreign Affairs and Security Policy and Vice-President of the European Commission

Federica Mogherini is the High Representative of the Union for Foreign Affairs and Security Policy and Vice-President of the European Commission since 1 November 2014.

She was the Italian Minister for Foreign Affairs from February to October 2014 and a Member of the Italian Parliament (Chamber of Deputies), where she was elected for the first time in 2008.

In her parliamentary capacity, she was the Head of the Italian Delegation to the NATO Parliamentary Assembly and Vice-President of its Political Committee (2013-2014); member of the Italian Delegation to the Parliamentary Assembly of the Council of Europe (2008-2013); Secretary of the Defence Committee (2008-2013) and member of the Foreign Affairs Committee.

She also coordinated the Inter-Parliamentary Group for Development Cooperation.

She has been in the leadership of the Democratic Party since it was founded, in 2007: first as Secretary for Institutional Reforms, then as a member of the National Council, and in 2013-2014 as Secretary for European and International Affairs.

She is member of the Istituto Affari Internazionali (IAI), of the Council for the United States and Italy and a Fellow of the German Marshall Fund for the United States.



Mauro Moretti

CEO of Finmeccanica

Mauro Moretti was appointed Chief Executive Officer and General Manager of Finmeccanica SpA on 15 May 2014. Mr Moretti also serves as President of the AeroSpace and Defence Industries Association of Europe (ASD). In September 2015 he was appointed Co-Chairman of the Italy-Japan Business Group. In 2014 he was made Honorary Chairman of AIAD, the Italian Federation for Aerospace, Defence and Security, and he has been President of the FS Foundation since 2013.

Mauro Moretti began his career in 1978 having been selected for a managerial position at the Italian State Railways Corporation. There he covered numerous roles, including Managing Director of the Technological Development Division (1993); CEO of Metropolis SpA, the FS real-estate company (1994); Director of the 'Rolling Stock and Locomotion' strategy business sector (1996); Director of the Network Rail strategic business sector (1997), becoming Chief Executive Officer of Rete Ferroviaria Italiana SpA in 2001. In 2006 he was appointed CEO of the State Railways Corporation which subsequently, and under his guidance, became Ferrovie dello Stato Italiane.

Mauro Moretti was born in Rimini, Italy, in 1953 and was awarded an honours degree in Electro-technical Engineering by the University of Bologna in 1977.



Reimund Neugebauer

President of the Fraunhofer-Gesellschaft

Professor Reimund Neugebauer was born in Thuringia, Germany, on 27 June 1953. He graduated from the Technische Universität Dresden (TUD) in 1979 with a degree in mechanical engineering. He completed his doctorate in 1984 at TUD, where he became professor in 1989. In 1991, he became director of the Fraunhofer Institute for Machine Tools and Forming Technology IWU with locations in Chemnitz, Dresden, Augsburg and Zittau. In 1993 he was appointed chair of the Machine Tools department at the Technische Universität Chemnitz (TU Chemnitz) and in 2000 he became managing director of TU Chemnitz's Institute of Machine Tools and Production Processes. On 1 October 2012, he took up the post of president of the Fraunhofer-Gesellschaft.

Professor Neugebauer is a Fellow of the International Academy for Production Engineering (CIRP) and a member of the National Academy of Science and Engineering (acatech). In 2015 Professor Neugebauer was appointed co-chair of the German federal government's High-Tech Forum. He is also on the executive board of the newly established 'Plattform Industrie 4.0', an alliance of representatives from politics, industry, associations, science and trade unions.



Arndt Schoenemann

Managing Director of Liebherr-Aerospace Lindenberg GmbH, Chairman of ASD Supply Chain and SME Group

Arndt Schoenemann is Managing Director at Liebherr-Aerospace Lindenberg GmbH, a position that he has held since 2008. He previously served as Managing Director of DASELL Cabin Interior GmbH from 2005 to 2008, as Head of Aviation, Equipment and Materials of the German Aerospace Industries Association (BDLI) from 2001 to 2005, Head of Procurement of DASELL Cabin Interior GmbH from 1992 to 2001 and Executive Employee Purchasing Buderus Sell GmbH (now: Sell GmbH, Herborn) from 1990 to 1992.

He is also Member of the Board of the German Aerospace Industries Association (BDLI) since 2005, Chairman of the Section Equipment and Materials and Vice President of the German Aerospace Industries Association (BDLI) since 2011, Chairman of the Board of Directors of Liebherr-LAMC Aviation (Changsha) Co., Ltd., Changsha, Hunan, China since 2013, Chairman of the Supply Chain Commission and SME Group of the AeroSpace and Defence Industries Association of Europe (ASD) since 2014, Chairman of the Shareholders' Committee of Aerospace Transmission Technologies (ATT), a joint company of Liebherr-Aerospace and Rolls-Royce since 2015, and is also Member of the Supervisory Board of Liebherr-Aerospace Nizhny Novogorod (LAN).



Teija Tiilikainen

Director of the Finnish Institute of International Affairs

Teija Tiilikainen is the Director of the Finnish Institute of International Affairs (FIIA). Before her appointment to this position in 2010 Dr. Tiilikainen was the Director of the Network of European Studies at the University of Helsinki (2003-2009). She also served as Secretary of State at the Ministry for Foreign Affairs of Finland from 2007 to 2008. In her research Dr. Tiilikainen has focused on issues related to European integration (institutional questions, the EU's external relations including CFSP and CSDP) and on European security policy. She has published widely on these topics; her recent book is an edited volume (together with Timo Behr) *Northern Europe and the Making of the EU's Mediterranean and Middle East Policies* (Ashgate, 2015).

Dr Tiilikainen was the Special Representative of the Prime Minister of Finland in the Convention on the Future of Europe in 2002-2003. Currently, she is also Editor-in-Chief of *Ulkopolitiikka*, the Finnish Journal of Foreign Affairs. Dr Tiilikainen is a member of the OSCE Panel of Eminent Persons on European Security as a Common Project led by Ambassador Wolfgang Ischinger.



Nick Witney

Former EDA Chief Executive, Senior Policy Fellow with the European Council on Foreign Relations (ECFR)

Nick Witney is a Senior Policy Fellow at ECFR. He previously served as the first Chief Executive of the European Defence Agency in Brussels. High Representative Javier Solana chose him in January 2004 to lead the project team charged with developing the concept and blueprint for the agency. The European Council approved the team's proposals in July 2004. After that, he was appointed to establish and run the agency for its first three years.

Nick Witney's earlier career was spent in British government service, first with the Foreign and Commonwealth Office and later with the Ministry of Defence (MOD). Working with the MOD, he took on a wide range of responsibilities, including planning and finance, defence exports (the al-Yamamah programme with Saudi Arabia), nuclear policy, the defence estate (running the privatisation of the MOD's married quarters housing stock), the new Labour government's 1998 Strategic Defence Review, the forward Equipment Programme, and defence industrial policy. His last job before leaving for Brussels was as the MOD's Director-General of International Security Policy. At ECFR, Nick co-directs the European Power programme.





List of abbreviations and acronyms

3OS	Third Offset Strategy
AG	Advisory Group
ASD	AeroSpace and Defence Industries Association of Europe
BRICS	Brazil, Russia, India, China and South Africa
CapTechs	Capability Technological Areas
CDP	Capability Development Plan
CSDP	Common Security and Defence Policy
DAG	Defence Advisory Group
DARPA	Defense Advanced Research Projects Agency
DG	Directorate-General
DoD	Department of Defense
ECSEL	Electronic Components and Systems for European Leadership
EDA	European Defence Agency
EDAB	European Defence Advisory Board
EDRP	EU-funded Defence Research Programme
EEAS	European External Action Service
EIB	European Investment Bank
EU-28	The twenty-eight members of the European Union
EU3+3	France, Germany, United Kingdom + China, Russia and the United States
EUGS	EU Global Strategy
EUISS	European Union Institute for Security Studies
EUR	Euro

GDP	Gross Domestic Product
GoP	Group of Personalities
GPS	Global Positioning System
H2020	Horizon 2020
IED	Improvised Explosive Devices
IPR	Intellectual Property Rights
ITAR	International Traffic in Arms Regulations
JTI	Joint Technology Initiative
JU	Joint Undertaking
LOI	Letter of Intent
MFF	Multiannual Financial Framework
MoD	Ministry of Defence
NATO	North Atlantic Treaty Organisation
OCCAR	Organisation for Joint Armament Cooperation
PA	Preparatory Action
PC	Programme Committee
PCP	Pre-Commercial Procurement
PP	Pilot Project
R&D	Research and Development
R&T	Research and Technology
RTO	Research Technology Organisation
SIPRI	Stockholm International Peace Research Institute
SMEs	Small and Medium Enterprises
SP	Scoping Paper
SRA	Strategic Research Agenda
TEU	Treaty on European Union
TFEU	Treaty on the Functioning of the European Union
TRL	Technological Readiness Level
UK	United Kingdom
USD	United States Dollars
USSR	Union of Soviet Socialist Republics
WP	Work Programme



In 2015, the European Commission invited key personalities from European industry, government, the European Parliament and academia to advise it on establishing a Preparatory Action on Common Security and Defence Policy (CSDP)-related research. The primary mission of this Group of Personalities was to help establish recommendations for a long-term vision for EU-funded CSDP-related research which can boost European defence cooperation. These recommendations address the overall scope and governance of future EU-funded CSDP research and highlight possible collaboration and coordination mechanisms. The overarching goal of the Preparatory Action and CSDP-related research is to create a framework that would facilitate a collaborative approach to defence among the member states.

